

ROAD SAFETY AUDIT

Harrison Boulevard Corridor

Town of Avon

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Prepared For:
Massachusetts Department of Transportation



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Background

The Harrison Boulevard corridor in Avon, Massachusetts has had four fatal crashes within the past nine years. As a result, the Town of Avon requested that the Massachusetts Department of Transportation (MassDOT) Highway Division Safety Section conduct a Road Safety Audit (RSA) for the corridor between the Route 24 on- and off-ramps and East Main Street. The goal of the RSA is to identify safety issues and provide potential enhancements to improve safety for all roadway users. Additionally, the potential enhancements are categorized by timeframe and cost which allows responsible agencies to determine when to make proposed implementations. Currently, there are no planned projects or improvements to the Harrison Boulevard corridor.

Project Data

The RSA for Harrison Boulevard was conducted by the audit team on July 14, 2014 at Avon Town Hall in Avon, Massachusetts. The members of the audit team comprised of representatives from local, regional, and state agencies ranging from emergency responders to transportation planners and engineers. The members and their affiliations are provided in **Table 1**. Contact information for the audit team members are provided in **Appendix B**.

Table 1. Participating Audit Team Members

Audit Team Member	Agency/Affiliation
Robert Spurr	Avon Fire Department
David Martineau	Avon Police Department
Paul Provost	Avon Water Department
Peter C. Marinelli	Avon Highway Department
Ray Guarino	Old Colony Planning Council
Edward C. Feeney	MassDOT District 5 Traffic
Barbara Lachance	MassDOT District 5 Traffic
Rich Oliveira	MassDOT District 5
Lisa Schletzbaum	MassDOT Highway Division Safety Section
Patrick Baxter	Toole Design Group (TDG)
Michelle Danila	Toole Design Group (TDG)

Audit team members received a meeting packet prior to the RSA. The packet included the meeting agenda, study area details and crash data details. The RSA agenda is provided in **Appendix A**. The crash data details and collision diagrams, graphical representation of the crash data, are provided in **Appendix C**. The audit members were asked to review the packet and visit the RSA study area prior to the meeting. Safety issues were identified by the team at the beginning of the RSA, followed by a review of a video of the corridor. The audit team determined that all the safety issues were identified and a site visit was not necessary. The audit team finished the meeting by determining appropriate countermeasures for the safety issues discussed.

The crash data and collision diagrams were based on crashes that were reported by Avon Police and occurred within the study area between January 1, 2011 and May 13, 2014. The crash data were provided by the Avon Police Department. According to the data, approximately 103 crashes were reported within the study area along Harrison Boulevard between January 1, 2011 and May 13, 2014. During the audit, the Avon Fire Department noted that the crash data seemed to be underestimating the number of crashes they respond to. It was determined that minor crashes are typically coded as incidents and are not included in this dataset.

The crash data has been broken down into 5 sections – Harrison Boulevard at the Route 24 Ramps, Harrison Boulevard at and near Pond Street, Harrison Boulevard at and near West Main Street, Harrison Boulevard at East Main Street and VFW Drive, and crashes that had unidentified locations. For the Harrison Boulevard at the Route 24 Ramps crash data, 18 crashes were reported with 8 resulting in an injury (44 percent of the crashes). The crash analysis shows that 72 percent (13 crashes) were rear-end crashes with the remaining being angle crashes (22 percent — 4 crashes) and a single vehicle crash. Crashes typically occurred in daylight (78 percent – 14 crashes), with clear weather (67 percent – 12 crashes), and on dry pavement (72 percent – 13 crashes). Harrison Boulevard crashes at the ramps typically occurred between 10am and noon (22 percent – 4 crashes) and 4pm and 6pm (22 percent – 4 crashes).

According to data compiled by MassDOT, Harrison Boulevard at Pond Street was a 2011 Highway Safety Improvement Plan (HSIP) cluster. A 2011 HSIP cluster means that during 2009-2011, the location was within the top 5 percent of crash locations throughout the OCPC region. For the crash data provided for the audit, the intersection of Harrison Boulevard and Pond Street had 22 crashes that were reported with 6 resulting in an injury (27 percent of the crashes). Of the 22 crashes that occurred at the intersection, 36 percent (8 crashes) were rear-end crashes and 23 percent (5 crashes) were sideswipe crashes. At the intersection of Harrison Boulevard and Pond Street, crashes typically occurred between 4pm and 6pm (23 percent – 5 crashes), under daylight conditions (68 percent – 15 crashes), and on dry pavement (64 percent – 14 crashes).

From the collision diagrams it appears that along the horizontal curve between Pond Street and West Main Street, 8 crashes occurred on the horizontal curve with 4 resulting in injury and 1 resulting in a fatality. These crashes were 38 percent (3 crashes) head-on, 25 percent (2 crashes) single vehicle, 25 percent (2 crashes) sideswipe, and 12 percent (1 crash) angle. The head-on crashes occurred at night and resulted in injuries or fatalities. Crashes on the horizontal curve between Pond Street and West Main Street typically occurred in the dark (63 percent – 5 crashes), with clear weather (88 percent – 7 crashes) and on dry pavement (88 percent – 7 crashes). During the RSA, the audit team reviewed the crashes that were unable to be located at or near an intersection. The audit members felt that these crashes may have occurred in the horizontal curve between Pond Street and West Main Street. There were 13 crashes that were unable to be located with 31 percent (4 crashes) coded as single vehicle crashes.

The Harrison Boulevard and West Main Street intersection has the highest number of crashes during the time period analyzed. There were 24 crashes reported with 6 resulting in an injury (25 percent of the crashes). Of the 24 crashes that occurred at the intersection, 46 percent (11 crashes) were angle crashes and 25 percent (6 crashes) were rear-end crashes. At the intersection of Harrison Boulevard and West Main Street, crashes typically occurred between 6am and 8am (25 percent – 6 crashes), in daylight (71

percent – 17 crashes), and on dry pavement (63 percent – 15 crashes). 33 percent – 8 crashes occurred on wet pavement. The audit team member have not noticed any issues with drainage or standing water at the intersection.

At the intersection of Harrison Boulevard and East Main Street, 17 crashes were reported with 41 percent (7 crashes) resulting in an injury. Of the 17 crashes that occurred at the intersection, 41 percent (7 crashes) were rear-end with 6 of those crashes occurring on the right-turn slip lane from Harrison Boulevard to East Main Street. At the intersection of Harrison Boulevard and East Main Street, crashes typically occurred between 4pm and 6pm (29 percent – 5 crashes), in daylight (65 percent – 11 crashes), and on dry pavement (82 percent – 14 crashes).

Project Location Description

The RSA study area includes Harrison Boulevard from the Route 24 on- and off-ramps to the roadways termination at the intersection of East Main Street. This east-west corridor is approximately 1.7 miles in length as shown in **Figure 1**. According to the MassDOT's Transportation Data Management System, 2006 traffic volumes on Harrison Boulevard to the west of Pond Street were 17,890 vehicles per day eastbound and 16,884 vehicles per day westbound.

Within the RSA study area, Harrison Boulevard intersects with Pond Street, West Main Street, and East Main Street which are all signalized intersections. Harrison Boulevard is classified by the MassDOT Bureau of Transportation Planning and Development as an urban minor arterial and is owned by the MassDOT. The posted speed limit along the corridor varies between 30 and 50 miles per hour. The speed limit on Harrison Boulevard Eastbound is 50 miles per hour through the Route 24 on- and off- ramps and between the signalized intersections of Pond and West Main streets, dropping to 40 miles per hour at the signalized intersections of Pond and West Main streets and 30 miles per hour prior to the intersection of East Main Street. For the Westbound direction of Harrison Boulevard, the speed limit is 40 miles per hour from East Main Street through the intersection with West Main Street and adjacent to the Pond Street intersection, rising to 50 miles per hour between the intersections of West Main and Pond streets and between Pond Street and the Route 24 on- and off-ramps.

Harrison Boulevard has two travel lanes in each direction with wide shoulders and is divided by a raised median with guardrail from the Route 24 on- and off-ramps through the intersection of Pond Street. To the east of the intersection of Pond Street, the roadway drops to one travel lane in each direction with wide shoulders and a double yellow centerline with sections of passing zones through the roadway's termination at East Main Street. Harrison Boulevard has no sidewalks or designated bicycle lanes, although the team noted that cyclists have been observed traveling along the corridor. Harrison Boulevard is used by emergency vehicles to access area hospitals.

The Harrison Boulevard interchange with Route 24 is a typical cloverleaf configuration. Route 24 is an urban principal arterial with the on- and off-ramps classified as urban minor arterials. The ramps and the Route 24 main line are owned by the MassDOT. Several of the on- and off-ramps have posted advisory speed limits of 25 miles per hour. Each of the on and off-ramps have one travel lane. The off-ramps from Route 24 to Harrison Boulevard have yield-controlled approaches.

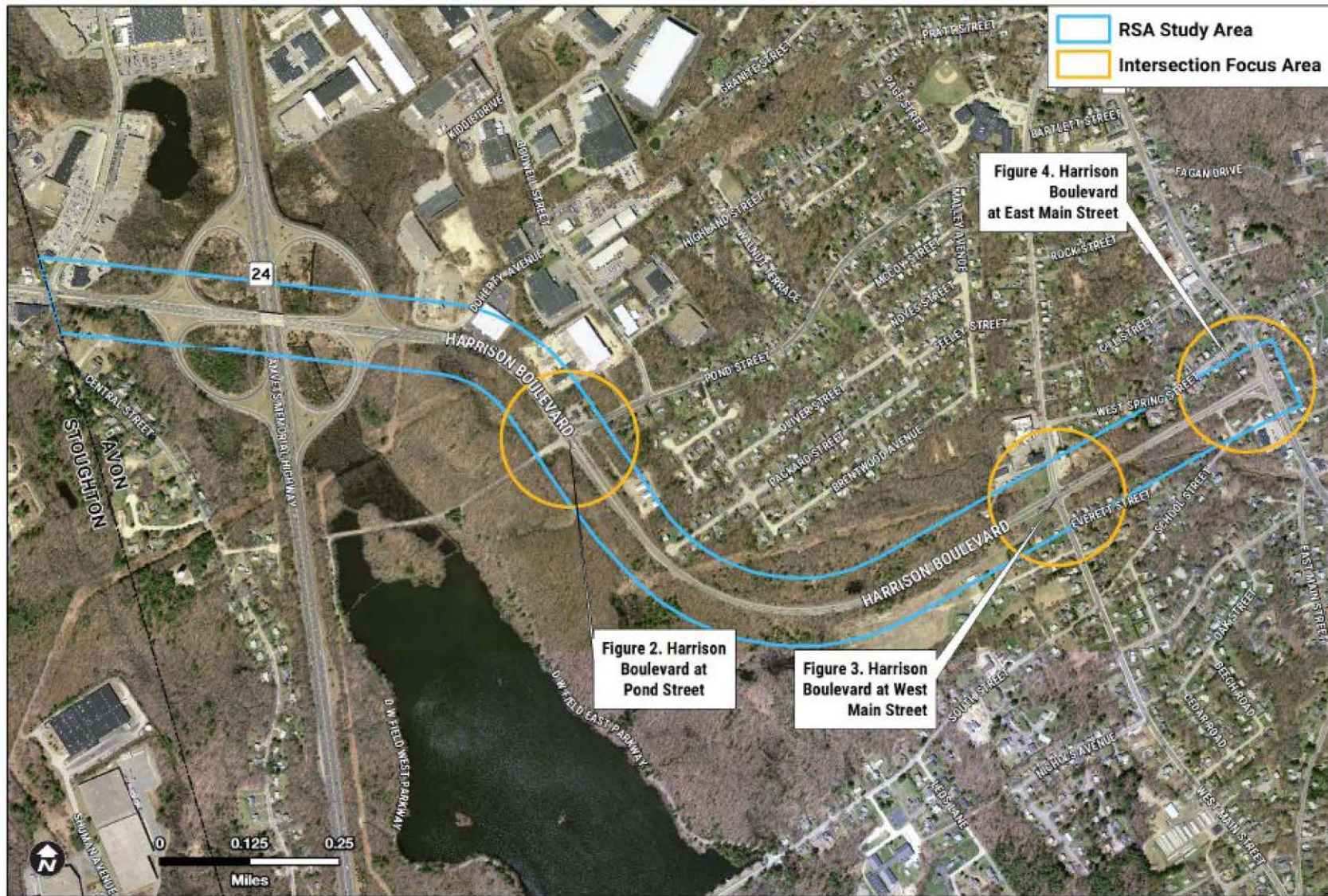


Figure 1 – Study Area Map

The intersection of Harrison Boulevard and Pond Street is a four-way signalized intersection, as shown in **Figure 2**. Pond Street is an urban minor arterial that is owned by the Town of Avon. The southern leg of Pond Street provides access to D.W. Field Park with restricted vehicular access by a gate which is locked between 9pm and 10am. Vehicles were observed to park along the southern leg of Pond Street. The Northbound Pond Street approach provides one travel lane. The eastbound Harrison Boulevard approach provides an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane. The eastbound exclusive left-turn and right-turn lanes are approximately 215 feet in length. The southbound Pond Street approach provides a shared left-turn/through lane and an exclusive right-turn lane. The westbound Harrison Boulevard approach provides an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane. The westbound exclusive left-turn and right-turn lanes are approximately 150 feet in length. The Harrison Boulevard approaches have overhead-mast-arm mounted signal equipment, while the Pond Street approaches have pedestal-mounted signal equipment. There are no pedestrian accommodations at this intersection although these users have been observed crossing Harrison Boulevard.

The intersection of Harrison Boulevard and West Main Street is a four-way signalized intersection, as shown in **Figure 3**. West Main Street is an urban minor arterial owned by the Town of Avon. The northbound West Main Street approach provides an exclusive left-turn lane and a shared through/right-turn lane. The eastbound Harrison Boulevard approach provides an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane. The eastbound exclusive left-turn lane is approximately 55 feet in length and the exclusive right-turn lane is approximately 140 feet in length. The southbound West Main Street approach provides an exclusive left-turn lane and a shared through/right-turn lane. The Westbound Harrison Boulevard approach provides an exclusive left-turn lane, one through lane, and a shared through/right-turn lane. The westbound exclusive left-turn lane is approximately 70 feet in length. All approaches have overhead mast-arm mounted signal equipment. Crosswalks and pedestrian indications are provided across the eastern, western, and southern legs of the intersections. ADA accessible curb ramps with detectable warning panels are provided at the intersection. The RSA team noted that this intersection has heavy pedestrian volumes.

The intersection of Harrison Boulevard and East Main Street is a signalized “T” intersection as shown in **Figure 4**. East Main Street is designated as Route 28 and is an urban principal arterial. East Main Street is owned by MassDOT. Harrison Boulevard terminates at this intersection. The northbound East Main Street approach provides an exclusive left-turn lane and two through lanes. The eastbound Harrison Boulevard approach provides an exclusive left-turn lane that is signal-controlled and a right-turn slip lane that is yield-controlled. The southbound East Main Street approach provides a through lane and a right-turn slip lane that is uncontrolled. The East Main Street approaches have overhead-mounted signal equipment with Harrison Boulevard having post-mounted signal equipment within the line of sight of the signalized approach. Crosswalks are provided across the Harrison Boulevard lanes but no pedestrian indications are provided. ADA accessible curb ramps with detectable warning panels are provided at the intersection. The audit team noted that the grass medians are not currently maintained.



Figure 2 – Harrison Boulevard at Pond Street



Figure 3 - Harrison Boulevard at West Main Street



Figure 4 - Harrison Boulevard at East Main Street

Road Safety Audit Observations and Potential Enhancements

During the RSA, the audit team identified the safety issues and discussed potential safety enhancements to address the issues. Several of the safety issues identified by the audit team were:

- Lighting;
- Roadway Alignment;
- Speed;
- Intersection Geometry and Operations;
- Signage; and
- Pedestrian and Bicycle Accommodations.

The following sections discuss in detail the safety issues and potential enhancements that were identified during the RSA. The safety issues and potential enhancements are separated by location.

Corridor-wide Issues

Safety Issue #1. Lighting

Observations:

The audit members noted that along Harrison Boulevard there is no street lighting provided except at the signalized intersections. Street lighting is provided along the intersecting roadways of Pond Street, West Main Street, and East Main Street. Based on the crash data provided, approximately 22 percent of the crashes occurred between 8pm and 6am.

Potential Enhancements:

1. Install street lighting along Harrison Boulevard as part of a long-term project.

Safety Issue #2. Horizontal Alignment

Observations:

The Harrison Boulevard corridor has two large curves between the Route 24 on- and off-ramps and West Main Street. Between the Route 24 on- and off-ramps and Pond Street, the roadway has two travel lanes in each direction and a raised median. Between Pond Street and West Main Street, the roadway drops to a single travel lane in each direction and has a long horizontal curve approximately ½ mile in length. The audit members noted that all of the fatalities that occurred in the last nine years occurred on this



stretch of roadway. The types of crashes that typically occur are single vehicle and head-on collision crashes.

With no street lights, the audit members noted the roadway is dark. The roadway is delineated with a centerline and edge lines but there were no observed reflectors. Audit members noted that the multiple transitions between the two lane section and the four lane section create unnecessary merges and vehicle conflicts. During the audit, a member recommended installing recessed pavement reflectors on the edge lines for the Harrison Boulevard corridor to increase visibility of the roadway alignment. MassDOT does not typically install recessed pavement reflectors on edge lines due to hazards for bicyclists and maintenance concerns.

Potential Enhancements:

1. Add a W1-2 curve warning sign for the eastbound direction east of Pond Street.
2. Install W1-8 chevron signs on the horizontal curve on Harrison Boulevard between Pond Street and West Main Street to provide increased visibility of the roadway curvature.
3. Add guardrail reflectors along Harrison Boulevard where there are existing guardrails to provide increased visibility of the roadway curvature.
4. Provide a median treatment to Harrison Boulevard between Pond Street and West Main Street to reduce the frequency of oncoming lane incursions.
 - a. Short term alternatives
 - i. Restripe to narrow the shoulders and provide a striped median with centerline rumble strips.
 - ii. Add centerline temporary curbing with flexible bollards
 - b. Long term recommendation
 - i. Consider adding a raised median, including granite curbing, a concrete or landscaped median surface, and guard rail.

Safety Issue #3. Speed

Observations:

The audit members noted that based on the Commonwealth of Massachusetts speed regulations, several existing posted speed limit signs are missing. In addition, the speed limits between the intersections are relatively high for a two lane roadway.

During the audit, team members discussed the potential of adding signal ahead warning signs with advisory speed placard as a method to reduce speeds at signalized intersections along the corridor. The discussion determined that due to lack of enforceability, a corridor-wide speed study was preferred.



Figure 6 - 50 MPH speed limit sign

Potential Enhancements:

1. Based on the Commonwealth's speed regulations for Harrison Boulevard, install R2-1 speed limit signs along the corridor where they are missing. This is a short-term, low-cost enhancement.
2. As a long-term project, consider conducting a speed study for Harrison Avenue to determine appropriate speed regulations.

Safety Issue #4. Signage

Observations:

The Harrison Boulevard corridor signs are old and may not meet current Manual on Uniform Traffic Control Devices (MUTCD) standards for size and retroreflectivity. It was observed at signalized intersections that 'Left Lane Must Turn Left' and 'Right Lane Must Turn Right' signs were used and are difficult to read along the corridor due to the roadway speed and the width of the roadway. In addition, several of the signalized intersections had crashes associated with last minute lane changes.

Potential Enhancements:

1. Upgrade signage along corridor to meet current MUTCD standards to provide enhanced consistency and visibility.
2. Add R3-8 lane use signs and D3-2 next signal signs at all signalized intersections to clearly designate lane arrangements on approach to the intersection.

Safety Issue #5. Vegetation

Observations:

The audit members noted that along Harrison Boulevard the adjacent vegetation is overgrown. In several locations the vegetation is blocking signs or roadway sight lines.

Potential Enhancements:

1. Trim or consider clearing vegetation to improve sight lines and sign visibility along Harrison Boulevard.



Figure 7 - Vegetation along the north side of Harrison Boulevard partially obstructing sign visibility

Safety Issue #6. Passing Zones

Observations:

On Harrison Avenue between Pond Street and West Main Street and between West Main Street and East Main Street, passing zones are provided. The audit team noted that the passing zones are not used due to the roadway widening at the intersections.

Potential Enhancements:

1. Consider removing the existing passing zones to reduce potential conflicts.

Safety Issue #7. Bicycle Accommodations

Observations:

The audit members noted that along Harrison Boulevard bicyclists have been observed. Currently, shoulders are provided but narrow at the signalized intersections, forcing cyclists to merge with vehicle traffic. No crashes were reported that included a bicyclist; however, audit members noted that bicycling along the corridor is a safety issue where shoulders narrow.



Figure 8 - Segment of Harrison Boulevard including wide shoulders

Potential Enhancements:

1. Provide adequate bicycle shoulder widths through the corridor to provide consistent space for cyclists.

Safety Issue #8. Truck Enforcement

Observations:

The audit team noted that Massachusetts State Police officers conduct truck enforcement along the corridor in one of the gravel pull off areas on Harrison Boulevard. The enforcement units are located on Harrison Boulevard approximately once a week. No reported crashes appear to be from the truck enforcement.

Potential Enhancements:

1. Consider providing a dedicated paved pull-off location along a tangent segment of Harrison Boulevard to allow safe clearance from moving traffic.

Safety Issue #9. Weather and Animals

Observations:

Harrison Boulevard is an east-west roadway that is lined with vegetation and parkland. As a result several crashes have resulted in limited visibility due to solar glare or from striking a large

animal. No additional enhancements are provided to reduce these crashes. However, installing the street lighting along the corridor may assist in limiting collisions with large animals.

Harrison Boulevard/Route 24 Interchange

Safety Issue #1. Speed

Observations:

The audit team noted that crashes typically occurred on the Harrison Boulevard Westbound to Route 24 Northbound on-ramp and the Harrison Boulevard Eastbound to Route 24 Southbound on-ramp. The crash data did not reflect these observations. The audit team did note that crashes on the ramps typically occur during the daylight and involve trucks.



Figure 9 - Route 24 northbound exit ramp terminus at Harrison Boulevard

Potential Enhancements:

1. Add W13-3 advisory speed sign on the Harrison Boulevard Eastbound to Route 24 Southbound on-ramp to reduce loss-of-control incidents.

Safety Issue #2. Pavement Quality

Observations:

The audit members noted that there are several potholes along the Route 24 on- and off-ramps at Harrison Boulevard.

Potential Enhancements:

1. Repair potholes or cold plane Route 24 on- and off-ramps at Harrison Boulevard.

Safety Issue #3. Acceleration/Deceleration Lanes

Observations:

The audit team noted that vehicles stop at the end of the off-ramps instead of yield to vehicles on Harrison Boulevard. This was observed for vehicles traveling from Route 24 Northbound to Harrison Boulevard Eastbound.

Potential Enhancements:

1. Evaluate if the acceleration and deceleration lanes for the Route 24 on- and off-ramps need to be extended on Harrison Boulevard.
2. Consider removing R1-2 YIELD signs if acceleration lanes are sufficient. The existing yield signs provide a confusing message.

Harrison Boulevard/Pond Street

Safety Issue #1. Intersection Geometry

Observations:

At the intersection of Harrison Boulevard and Pond Street, Harrison Boulevard widens to accommodate turn lanes. The crash data shows several sideswipe and turning collisions; observations by audit members indicate that vehicles are making last minute lane changes to travel in their intended direction.

In addition, the Harrison Boulevard eastbound approach has a high left turning volume. The queue length tends to extend beyond the existing left turn pocket. Team members noted the difficulty weaving into the left turn lane when exiting from Route 24 northbound, which is exacerbated by the heavy eastbound through volume combined with the short distance between the ramp and the end of the queue.



Figure 10 - Harrison Boulevard southbound approach to Pond Street

Audit members also noted that they have observed eastbound vehicles performing a right turn onto Pond Street southbound, followed by a U-turn, and then proceeding through the Harrison Boulevard intersection to continue northbound. This movement is drivers that may be bypassing the long queues of the Harrison Boulevard eastbound left turn lane.

Potential Enhancements:

1. Add R3-8 lane use signs for the eastbound, westbound, and southbound approaches to clearly designate lane arrangements on approach to the intersection.
2. As a short-term measure, evaluate signal timing to increase capacity for the eastbound left turn phase.
3. Consider extending the eastbound left-turn lane or widening to a double left turn lane in order to increase capacity.

Safety Issue #2. Signage

Observations:

According to the crash data and observations by audit members, Harrison Boulevard eastbound has several vehicles making U-turns at the intersection with Pond Street. The audit team noted that motorists unfamiliar with area that are trying to access the Merchants Park shopping area (including IKEA) are mistakenly using the eastbound exit from Route 24 and then making U-turns at the intersection because it is the first intersection after the interchange. Drivers

performing a U-turn at this location may conflict with the southbound right turn movement, which is provided with an exclusive right turn phase overlapping with the eastbound left turn phase. There were no reported crashes as a result of this; however, the audit members determine it was a safety issue.

The ‘No U-turns’ sign is located on the far side of the intersection on the signal post. In addition to the ‘No U-turn’ sign, LEFT TURN SIGNAL and KEEP RIGHT signs are posted on the signal post. RSA members noted that the current placement of the R3-4 may not be visible to a driver until they are mid-turn or not at all because of the two additional signs above it.



Figure 11 - Signs mounted to the signal pedestal in the median

Potential Enhancements:

1. Consider updating the expressway guide signs on Route 24 for Exit 19B to include both Central Street and Stockwell Drive in order to reduce the number of U-turns on Harrison Boulevard.
2. Remove ‘LEFT TURN SIGNAL’ sign on the existing far-side signal pole and maintain the R4-7 ‘KEEP RIGHT’ and R3-4 ‘NO U-TURN’ sign to improve the conspicuity of the R3-4.
3. Add near-side R3-4 ‘NO U-TURN’ sign on the Harrison Boulevard eastbound approach to increase compliance.

Safety Issue #3. Heavy Vehicles

Observations:

The Harrison Boulevard corridor between Route 24 and Pond Street has a high percentage of heavy vehicles. The heavy truck route is from Harrison Boulevard eastbound to Pond Street northbound and Pond Street southbound to Harrison Boulevard westbound. The heavy vehicles are accessing the industrial area off Bodwell Street. As a result, the audit team noted that the pavement quality for those movements is poor and rutting. The quality of pavement may cause drainage issues and

reduced traction under braking. One crash occurred on this approach under icy conditions, which may be due to the poor pavement quality.



Figure 12 - Large trucks turning left into Pond Street

The audit team noted that trucks have been observed parking on the Pond Street southbound right lane to access the Bank of America located on the northwest corner of the intersection of Harrison Boulevard and Pond Street. Parked trucks at this location partially or entirely block the right turn lane, potentially causing weaving issues for approaching vehicles.

Potential Enhancements:

1. Repair pavement quality in Harrison Boulevard's eastbound left-turn lane and Pond Street southbound approach.
2. Install R7-1 NO PARKING signs on the Pond Street southbound approach to eliminate trucks parking in this location.

Safety Issue #4. Pedestrian Accommodations

Observations:

The intersection of Harrison Boulevard and Pond Street has no pedestrian accommodations. The audit team and observations indicated that pedestrians and bicyclists are crossing Harrison Boulevard at the intersection. No crosswalks, curb ramps, or pedestrian indications are provided. No pedestrian crashes were reported in the crash data.

Potential Enhancements:

1. Install crosswalks, curb ramps with detectable warning panels, pedestrian indications, and accessible pushbuttons across the Harrison Boulevard eastbound approach to provide fully accessible crosswalks.
2. Extend Pond Street west side sidewalk to the intersection of Harrison Boulevard to provide pedestrian access to DW Field Park.



Figure 13 - Pedestrian walking a bicycle across the intersection with no crosswalk

Safety Issue #5. Traffic Signals

Observations:

The audit team noted that the traffic signals on the Pond Street approaches are post-mounted on the corners and not overhead in line with the approach lanes, as recommended in the MUTCD. This may have been a factor in a crash where a southbound driver ran a red light and caused a crash within the intersection.

Potential Enhancements:

1. Upgrade Pond Street traffic signals to overhead mast-arm mounted signals to provide signal indications aligned with the approach lanes, as recommended in the latest version of the MUTCD.



Figure 14 - Pond Street eastbound approach with pedestal mounted signals

Harrison Boulevard/West Main Street

Safety Issue #1. Intersection Operations

Observations:

The audit team noted that drivers frequently run red lights at this location, which resulted in four reported crashes during the study period. The audit team also noted that the emergency vehicle pre-emption equipment installed at this location is not functioning. While no crashes were reported that were related to the malfunctioning equipment, it does increase response times for emergency vehicles traveling to incidents at other locations.

The team also noted that the eastbound right turn movement operates like a free-flow due to the right-turn phase which overlaps the northbound left turn phase. Drivers used to the long green light sometimes fail to stop before making right turns on red. Residents located off nearby roadways such as Klondike Road have reported difficulty exiting their roadway due to the free flowing right turns from Harrison Boulevard.

Queue lengths on the eastbound through lane often extend beyond the existing eastbound left turn lane, resulting in impatient drivers who sometimes cross the double yellow centerline to bypass stopped through vehicles and access the left turn lane. While there are no reported crashes related to this issue, the centerline violations are a safety hazard for oncoming westbound vehicles.



Figure 15 - Harrison Boulevard eastbound approach to West Main Street

During the audit, team members mentioned installing ‘Red Signal Ahead’ dynamic signs to inform drivers of the upcoming signal. Currently, MassDOT installs ‘Red Signal Ahead’ dynamic signs in areas where the signal is physically blocked by an unmovable feature. Harrison Boulevard at West Main Street does not meet this requirement and therefore is not recommended at this location.

Potential Enhancements:

1. Evaluate all-red signal clearance phase to ensure clearance time is sufficient. Evaluate loop detectors design speed to reduce dilemma zone.
2. Repair pre-emption equipment to improve response times for emergency vehicles traveling to nearby incidents.
3. Consider extending the left turn lane to allow vehicles to bypass average through-lane queues.

Safety Issue #2. Weather

Observations:

Crash data indicated 33 percent of crashes occur on wet pavement at this intersection. This proportion of crashes is on the higher end of what similar intersections typically experience. The audit team has not noticed ponding issues. Two crash reports indicated loss of traction due to wet conditions, including one that noted ponding in the vicinity of a catch basin.

Potential Enhancements:

1. Conduct annual maintenance on all existing drainage infrastructure to ensure that facilities are not blocked resulting in ponding within the roadway.
2. Evaluate drainage structures to ensure there is no excessive ponding or sheet-flow.
3. Evaluate frequency of snow plowing along Harrison Boulevard to improve roadway conditions during winter months.

Safety Issue #3. Pedestrian Accommodations

Observations:

The intersection of Harrison Boulevard and West Main Street has crosswalks, curb ramps with detectable warning panels, and pedestrian indications. The audit team noted that there is a heavy pedestrian movement across Harrison Boulevard. No pedestrian crashes were reported in the crash data.

Potential Enhancements:

1. Upgrade pedestrian signals to provide countdown indications and accessible push buttons.
2. Evaluate the pedestrian signal clearance time for MUTCD-compliance.
3. Consider installing pedestrian median refuge islands to provide a protected waiting area for pedestrians that do not make it across during the pedestrian phase.



Figure 16 - Pedestrian signal indication and crosswalk

Safety Issue #4. Enforcement

Observations:

Avon Police maintain frequent enforcement at this location to minimize red light running, however drivers occasionally cause rear-end collisions due to the visibility of the police cruisers stationed at the intersection.

Potential Enhancements:

1. Consider posting police enforcement units at a location less visible to through traffic to reduce rear end collisions.

Harrison Boulevard/East Main Street

Safety Issue #1. Intersection Operations

Observations:

The audit team noted that vehicles taking left-turns from East Main Street northbound onto Harrison Boulevard westbound tend to operate through the yellow and red clearance phases. Crash data showed two injury crashes involving northbound left turning vehicles, including one where the left turning driver failed to stop for the red left turn arrow indication. In addition, several vehicles have been observed as taking a left-turn from the middle northbound through lane onto Harrison Boulevard westbound.



Figure 17 - Harrison Boulevard eastbound approach to East Main Street

Crosswalks are provided across the Harrison Boulevard approach and slip lanes; however, no crosswalks are provided across East Main Street. In addition, the Harrison Boulevard crosswalks have no pedestrian indications at the signalized approaches or warning signs at the uncontrolled slip lanes.

Potential Enhancements:

1. Evaluate all clearance intervals for the intersection to ensure they meet MassDOT criteria.
2. Evaluate the need for a pedestrian crosswalk across East Main Street. If determined necessary, install ADA-compliant curb ramps and MUTCD-compliant pedestrian indications and timing.
3. Install pedestrian indications and push buttons for the signalized approaches with crosswalks and install W1-1 Pedestrian warning signs for the uncontrolled crosswalks to increase yielding compliance.
4. As a short-term measure, evaluate signal timing to increase capacity for the northbound left turn phase.
5. Perform a traffic capacity analysis to determine if a double-left turn lane is warranted for the northbound approach. Widen for a double left turn lane if necessary.

Safety Issue #2. Intersection Geometry

Observations:

The crash data analysis noted that 35 percent of the crashes at the intersection with East Main Street were rear-end crashes of vehicles traveling on the slip lane from Harrison Boulevard to East Main Street southbound. The audit team noted that with the yield-controlled approach, drivers may be anticipating that the vehicle in front of them has cleared the intersection while they are looking back for a gap in traffic.



Figure 18 - Right turn slip lane on the Harrison Boulevard eastbound approach

Observations were noted by a team member that downstream congestion on East Main Street may be a contributing factor to the conflict with southbound East Main Street and right turning vehicles. Southbound East Main Street vehicles may be moving to the right to avoid a congested shared left and through travel lane ahead.

Potential Enhancements:

1. Consider either removing the right turn slip lane and combining the right turn lane under signal control or modifying the geometry to provide a defined yield point at a better angle to allow drivers to see cross-traffic.
2. Review the corridor signal operations on East Main Street.

Safety Issue #3. Signage

Observations:

At the T-intersection of Harrison Boulevard and East Main Street, no warning signs are provided for the termination of Harrison Boulevard eastbound approach.

Potential Enhancements:

1. Add W1-7 Two-Direction Large Arrow sign on the east side of East Main Street opposite the Harrison Boulevard eastbound approach to warn drivers that a turn is required.

Safety Issue #4. Maintenance

Observations:

The audit team noted that the grass islands are not maintained at the intersection of East Main Street and Harrison Boulevard.

Potential Enhancements:

1. Direct maintenance crews to maintain grass and weeds for clear sight lines.
2. Consider replacing the grass island with concrete islands to reduce maintenance requirements.

Harrison Boulevard/Stockwell Drive

Safety Issue #1. Access Management

Observations:

Although outside the RSA study area, the audit team noted that vehicles are traveling the wrong way on the divided segment of Harrison Boulevard on the town line between Stoughton and Avon. A gas station located on the northwest corner of the signalized intersection of Harrison Boulevard and Stockwell Drive has two access driveways off Harrison Boulevard westbound which is separated from Harrison Boulevard eastbound by a raised median. Vehicles exiting the gas station are taking a left and traveling a short distance along Harrison Boulevard westbound in the eastbound direction to get to the signalized intersection.

Potential Enhancements:

1. Install R3-2 NO LEFT TURN signs at each gas station driveway.

Summary of Road Safety Audit

Table 2 lists each safety issue and the corresponding potential safety enhancements that were discussed at the audit and within the previous section. The safety issues and potential safety enhancements are divided by location. For each observed safety issue and potential safety enhancement, the table includes the safety payoff, estimated time frame for completion, estimated construction cost, and the responsible agency. Safety payoff estimates are subjective and may be based on the relative percent of crashes that may be reduced by the enhancement; for example, low (<30 percent), medium (31 percent to 70 percent), and high (>71 percent). The time frame is categorized as short-term (<1 year), mid-term (1 to 3 years), or long-term (>3 years). The costs are categorized as low (<\$10,000), medium (\$10,001 to \$50,000), or high (>\$50,001).

Table 2. Potential Safety Enhancement Summary

Location	Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Corridor-wide	Lighting	Install street lighting.	High	Long-term	High	MassDOT
	Horizontal Alignment	Add a W1-2 curve warning sign for the eastbound direction east of Pond Street.	Low	Short-term	Low	MassDOT
		Install W1-8 chevrons on the curve between Pond Street and West Main Street.	Medium	Short-term	Low	MassDOT
		Add guardrail reflectors.	Medium	Short-term	Low	MassDOT
		Consider adding centerline temporary curbing with flexible bollards or barriers.	High	Mid-term	Medium	MassDOT
		Consider restriping the roadway to provide a painted center median with centerline rumble strips and narrower shoulders.	High	Short-term	Medium	MassDOT
		Consider adding a raised median.	High	Long-term	High	MassDOT
	Speed	Install R2-1 Speed Limit signs.	Low	Short-term	Low	MassDOT
		Consider conducting a speed study.	Medium	Mid-term	Low	MassDOT
	Signage	Upgrade signage to meet current MUTCD standards.	Medium	Short-term	Low	MassDOT
		Add R3-8 Lane Use signs and D3-2 Next Signal signs at all signalized intersections.	Medium	Short-term	Low	MassDOT
	Vegetation	Trim or consider clearing vegetation to improve sight lines and sign visibility.	Low	Short-term	Low	MassDOT
	Passing Zones	Consider removing the existing passing zones.	Low	Mid-term	Low	MassDOT
	Bicycle Accommodations	Provide adequate bicycle shoulders.	Medium	Long-term	Medium	MassDOT
	Truck Enforcement	Consider providing a dedicated paved pull-off location along a tangent road segment.	Low	Mid-term	Medium	MassDOT

Table 2. Potential Safety Enhancement Summary (cont.)

Location	Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Harrison Boulevard/ Route 24 Interchange	Speed	Add W13-3 Advisory Speed sign on the Harrison Boulevard Eastbound to Route 24 Southbound on-ramp.	Low	Short-term	Low	MassDOT
	Pavement Quality	Repair potholes or cold plane Route 24 on- and off-ramps.	Low	Mid-term	Medium	MassDOT
	Acceleration/Deceleration Lanes	Evaluate if the acceleration and deceleration lanes for the Route 24 on- and off-ramps need to be extended.	Medium	Long-term	High	MassDOT
		Consider removing R1-2 YIELD signs if acceleration lanes are sufficient.	Medium	Short-term	Low	MassDOT
Harrison Boulevard/ Pond Street	Intersection Geometry	Add R3-8 lane use signs for the eastbound, westbound, and southbound approaches.	Low	Short-term	Low	MassDOT
		Evaluate signal timing to improve capacity for the eastbound left turn phase.	Medium	Short-term	Low	MassDOT
		Extend the eastbound left-turn lane or widen for a double left turn lane.	Medium	Long-term	High	MassDOT
	Signage	Consider updating the guide signs on Route 24.	Low	Short-term	Medium	MassDOT
		Remove LEFT TURN SIGNAL sign on the existing far-side signal pole and maintain the KEEP RIGHT and NO U-TURN sign.	Low	Short-term	Low	MassDOT
		Add near-side R3-4 NO U-TURN sign on the Harrison Boulevard eastbound approach.	Low	Short-term	Low	MassDOT
	Heavy Vehicles	Repair pavement quality in Harrison Boulevard's eastbound left-turn lane and Pond Street southbound approach.	Medium	Long-term	Medium	MassDOT
		Install R7-1 NO PARKING signs on the Pond Street southbound approach.	Low	Short-term	Low	MassDOT

Table 2. Potential Safety Enhancement Summary (cont.)

Location	Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Harrison Boulevard/ Pond Street (cont.)	Pedestrian Accommodations	Install crosswalks, curb ramps with detectable warning panels, pedestrian indications, and accessible push buttons on the Harrison Boulevard eastbound approach.	Medium	Mid-term	Medium	MassDOT
		Extend Pond Street west side sidewalk to the intersection of Harrison Boulevard.	Medium	Mid-term	Medium	Town of Avon
	Traffic Signals	Upgrade Pond Street traffic signals to overhead-mounted signals.	Medium	Mid-term	Medium	MassDOT
Harrison Boulevard/ West Main Street	Intersection Operations	Evaluate all-red signal clearance phase and loop detector design speed.	Medium	Short-term	Low	MassDOT
		Repair pre-emption equipment.	Medium	Short-term	Low	MassDOT
		Extend the left turn lane to allow turning vehicles to bypass the through vehicle queue.	Medium	Long-term	High	MassDOT
	Weather	Conduct annual maintenance on existing drainage infrastructure.	Medium	Short-term	Low	MassDOT
		Evaluate drainage structures to ensure there is no excessive ponding or sheet-flow.	Medium	Mid-term	Medium	MassDOT
		Evaluate frequency of snow plowing.	Medium	Short-term	Low	MassDOT
	Pedestrian Accommodations	Upgrade pedestrian indications to countdown indications and accessible push buttons.	Low	Mid-term	Medium	MassDOT
		Evaluate pedestrian signal clearance time for MUTCD-compliance.	Medium	Short-term	Low	MassDOT
		Install pedestrian median refuge islands.	Medium	Mid-term	High	MassDOT
	Enforcement	Consider posting police enforcement units at a less visible location to through-traffic.	High	Short-term	Low	Town of Avon

Table 2. Potential Safety Enhancement Summary (cont.)

Location	Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Harrison Boulevard/ East Main Street	Intersection Operations	Evaluate all clearance intervals for the intersection.	High	Short-term	Low	MassDOT
		Evaluate the need for a pedestrian crosswalk across East Main Street. If determined necessary, install ADA-compliant curb ramps and MUTCD-compliant pedestrian indications and timing.	Low	Mid-term	Medium	MassDOT
		Install pedestrian indications for the signalized approaches with crosswalks and install warning signs for the uncontrolled crosswalks.	Medium	Mid-term	Medium	MassDOT
		Evaluate signal timing to improve capacity for the northbound left turn phase.	Medium	Short-term	Low	MassDOT
		Widen for a double left turn lane if warranted by capacity analysis.	Medium	Long-term	High	MassDOT
	Intersection Geometry	Consider either removing the right turn slip lane or modifying the geometry.	High	Long-term	High	MassDOT
		Review the corridor signal operations on East Main Street.	Low	Mid-term	Medium	MassDOT
	Signage	Add W1-7 'Two-Direction Large Arrow' sign.	Low	Short-term	Low	MassDOT
	Maintenance	Direct maintenance crews to cut grass.	Low	Short-term	Low	MassDOT
		Consider replacing the grass island with concrete islands.	Low	Mid-term	Medium	MassDOT
Harrison Boulevard/ Stockwell Drive	Access Management	Install R3-2 NO LEFT TURN signs at each gas station driveway.	Medium	Short-term	Low	MassDOT

Appendix A. RSA Meeting Agenda

Participating Audit Team Members

Date: 7/14/2014

Location: Avon Town Hall, Avon, MA

Audit Team Members	Agency/Affiliation	Email Address	Phone Number
Robert Spurr	Avon Fire Department	rspurr@avonmass.org	508-583-5361
David Martineau	Avon Police Department	dmartineau@avonmass.org	508-583-6677
Paul Provost	Avon Water Department	pprovost@avonmass.org	508-583-2620
Peter C. Marinelli	Avon Highway Department	pmarinelli@avonmass.org	508-588-0414
Ray Guarino	Old Colony Planning Council	rguarino@ocpcrpa.org	508-583-1833 x212
Edward C. Feeney	MassDOT District 5	edward.feeney@state.ma.us	508-884-4242
Barbara Lachance	MassDOT District 5	barbara.lachance@dot.state.ma.us	508-884-4260
Richard Oliveira	MassDOT District 5	richard.oliveira@dot.state.ma.us	
Lisa Schletzbaum	MassDOT Highway Section	lisa.schletzbaum@state.ma.us	857-368-9634
Patrick Baxter	Toole Design Group	pbaxter@tooledesign.com	617-619-9910 x207
Michelle Danila	Toole Design Group	mdanila@tooledesign.com	617-619-9910 x201

Appendix B. RSA Audit Team Contact List

Participating Audit Team Members

Date: 7/14/2014

Location: Avon Town Hall, Avon, MA

Audit Team Members	Agency/Affiliation	Email Address	Phone Number
Robert Spurr	Avon Fire Department	rspurr@avonmass.org	508-583-5361
David Martineau	Avon Police Department	dmartineau@avonmass.org	508-583-6677
Paul Provost	Avon Water Department	pprovost@avonmass.org	508-583-2620
Peter C. Marinelli	Avon Highway Department	pmarinelli@avonmass.org	508-588-0414
Ray Guarino	Old Colony Planning Council	rguarino@ocpcrpa.org	508-583-1833 x212
Edward C. Feeney	MassDOT District 5	edward.feeney@state.ma.us	508-884-4242
Barbara Lachance	MassDOT District 5	barbara.lachance@dot.state.ma.us	508-884-4260
Richard Oliveira	MassDOT District 5	richard.oliveira@dot.state.ma.us	
Lisa Schletzbaum	MassDOT Highway Section	lisa.schletzbaum@state.ma.us	857-368-9634
Patrick Baxter	Toole Design Group	pbaxter@tooledesign.com	617-619-9910 x207
Michelle Danila	Toole Design Group	mdanila@tooledesign.com	617-619-9910 x201

Appendix C. Detailed Crash Data

COLLISION DIAGRAM A

SYMBOLS

- Moving Vehicle
- ← Backing Vehicle
- - - Non-Involved Vehicle
- 🚶 Pedestrian
- 🚲 Bicycle
- 🐾 Animal
- 🚗 Parked Vehicle
- 📦 Fixed Object

TYPES OF CRASH

- ↔ Head on
- Rear End
- ↘ Angle
- ↻ Turning Movement
- ↔ Sideswipe
- 🚗 Out of Control
- 🌙 Night Time Crash

SEVERITY

- Injury
- Fatal

Avon, MA

Harrison Blvd. at Route 24 Ramps

REGION: OCPC

TIME PERIOD ANALYZED: 2011 - 4/4/2014

SOURCE OF CRASH REPORTS: Avon Police Department

DATE PREPARED: July 7, 2014

PREPARED BY: co



*NOT TO SCALE

24 SB to Harrison WB

24 NB to Harrison WB

Harrison WB to 24 NB

Harrison WB to 24 SB

Unable to determine whether
crashes occurred on ramp
from Rt 24 SB or Rt 24 NB:

1 6 12

Harrison Blvd

②

18

17

4 ⑮

③

Unable to determine whether
crashes occurred on ramp
from Rt 24 SB or Rt 24 NB:

⑧ 10 ⑪ 9

Harrison EB to 24 SB

Harrison EB to 24 NB

24 SB to Harrison EB

24 NB to Harrison EB

Harrison Blvd

5

⑦ 13 ⑯

Crash Data Summary Table

Harrison Blvd. at Route 24 Ramps, Avon, MA (Collision Diagram A)

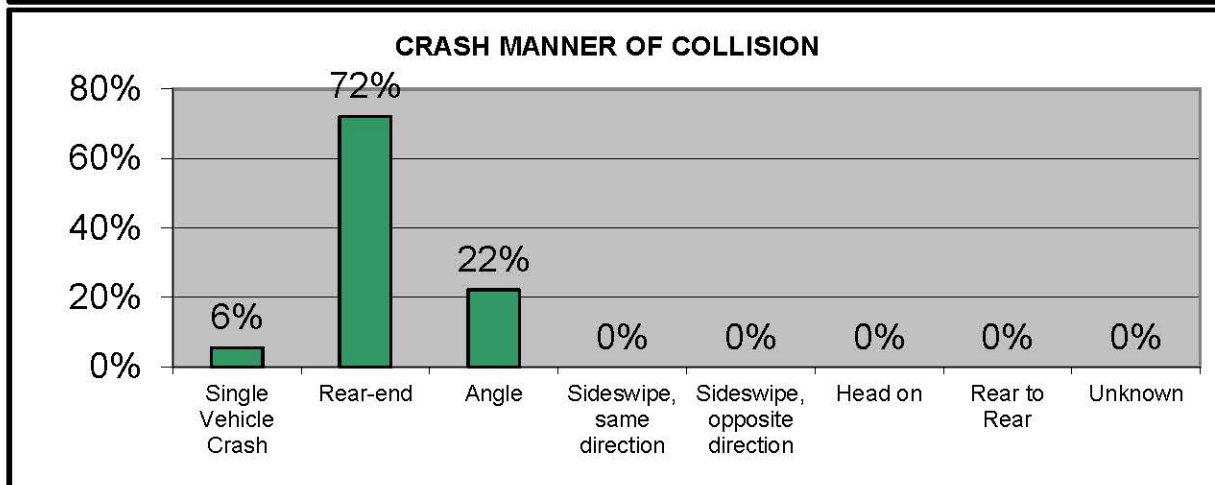
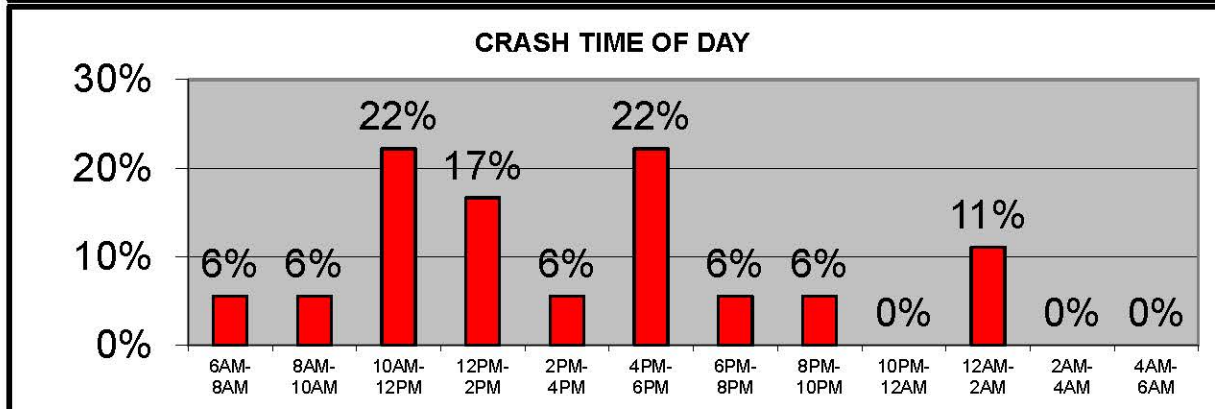
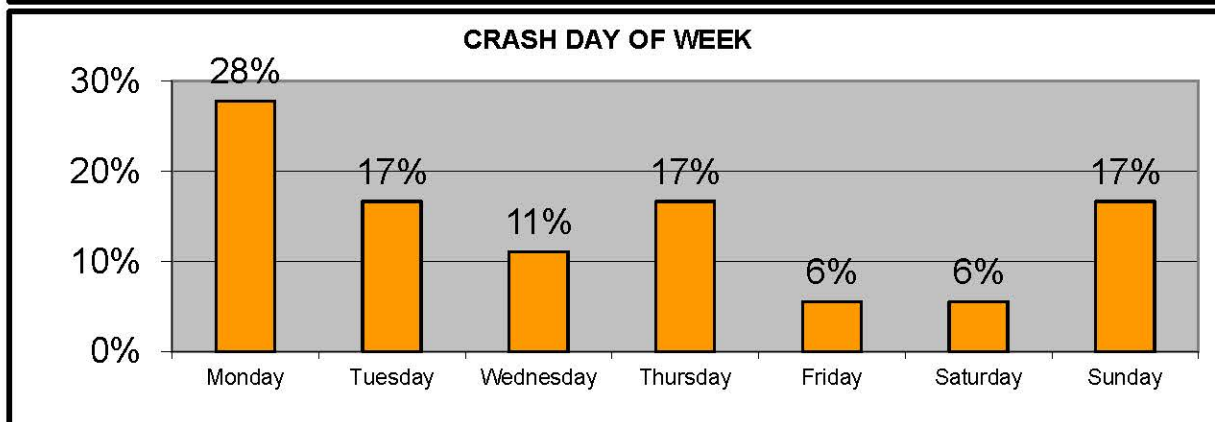
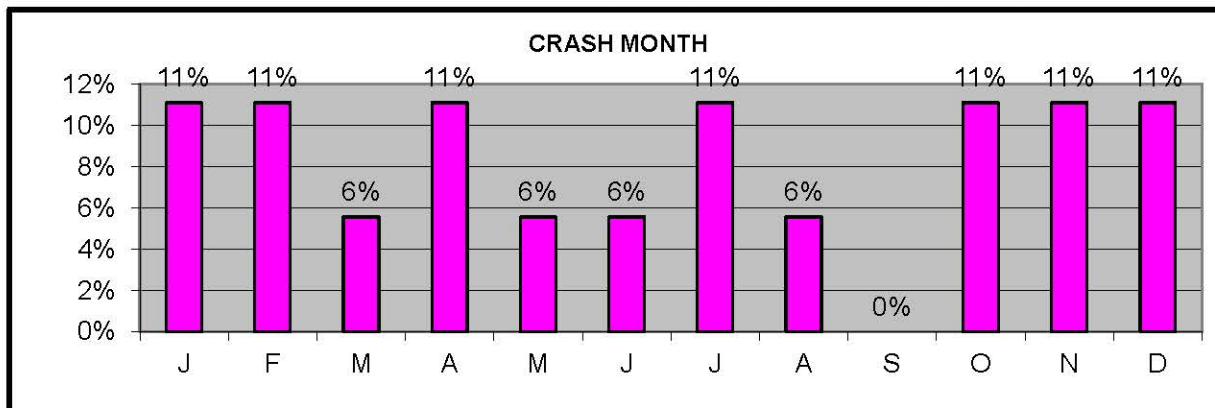
1/1/2011 - 4/4/2014

Crash Diagram Ref #	Crash Date <i>mm/dd/yy</i>	Time of Day	Manner of Collision		Light Condition		Weather Condition		Road Surface		Driver Contributing Code <i>Type</i>	Ages								Comments
			#	<i>Type</i>	#	<i>Type</i>	#	<i>Type</i>	#	<i>Type</i>		DOB	DOB	DOB	DOB	D1	D2	D3	D4	
1	1/17/11	11:14 AM	2	Rear-end	1	Daylight	1	Clear	1	Dry	1	No Improper Driving	7/26/1981	3/19/1971			29	39		V1 rear-ended an unaffiliated vehicle causing V2 to rear-end V1. Unknown whether crash occurred on off-ramp from 24 NB or SB.
2	1/30/11	12:12 PM	2	Rear-end	1	Daylight	1	Clear	1	Dry	19	Inattention	12/28/1988	6/23/1956			22	54		V1 did not expect V2 to stop. V2 had difficulty looking over mounds of snow.
3	7/25/11	12:19 AM	2	Rear-end	5	Dark - roadway not lighted	1	Clear	1	Dry	19	Inattention	8/16/1988	11/28/1982			22	28		V1 did not see V2 enter Harrison Blvd from ramp and rear-ended it.
4	10/20/11	4:30 PM	3	Angle	1	Daylight	1	Clear	1	Dry	4	Failed to yield right of way	1/16/1963	5/17/1980			48	31		V2 realized that he needed to get on Rt 24 while in the left lane and changed lanes into V1.
5	10/19/11	12:01 PM	1	Single Vehicle Crash	1	Daylight	3	Rain	2	Wet	7	Driving too fast for conditions	8/11/1985				26			While merging onto Rt 24, V1 lost control.
6	11/29/11	7:20 PM	2	Rear-end	4	Dark - lighted roadway	99	Unknown	99	Unknown	5	Followed too closely	11/24/1972	2/21/1951			39	60		Unknown whether crash occurred on off-ramp from 24 NB or SB.
7	2/21/12	4:50 PM	2	Rear-end	1	Daylight	1	Clear	1	Dry	19	Inattention	1/14/1977	9/5/1958			35	53		V2 was slowly merging onto Harrison Blvd when V1 hit it.
8	3/4/12	4:30 PM	2	Rear-end	3	Dusk	1	Clear	1	Dry	19	Inattention	3/8/1974	3/7/1973			37	38		V1 did not realize that V2 was stopped. Unknown whether crash occurred on off-ramp from 24 NB or SB.
9	5/7/12	6:00 AM	3	Angle	1	Daylight	1	Clear	1	Dry	4	Failed to yield right of way	4/8/1986	2/5/1992			26	20		Unknown whether crash occurred on off-ramp from 24 NB or SB.
10	7/30/12	9:00 PM	2	Rear-end	5	Dark - roadway not lighted	1	Clear	1	Dry	5	Followed too closely	11/26/1993	9/12/1989			18	22		Uninvolved vehicle stopped at yield sign causing V1 to slam on brakes causing V2 to rear-end V1. Unknown whether crash occurred on off-ramp from 24 NB or SB.
11	2/13/13	12:45 PM	2	Rear-end	1	Daylight	1	Clear	2	Wet	19	Inattention	8/21/1981	7/27/1979			31	33		V1 stopped to merge onto Harrison Blvd when V2 hit it. Unknown whether crash occurred on off-ramp from 24 NB or SB.
12	4/13/13	1:25 AM	2	Rear-end	1	Daylight	2	Cloudy	1	Dry	19	Inattention	12/22/1953	5/19/1975			59	37		V2 stopped behind V1. V2 attempted to merge onto Harrison Blvd but V1 did not. Unknown whether crash occurred on off-ramp from 24 NB or SB.
13	6/17/13	2:45 PM	3	Angle	1	Daylight	2	Cloudy	2	Wet	99	Unknown	7/8/1974	1/29/1966			38	47		Both vehicles waiting to merge onto Harrison Blvd when V1 hit V2. Crash coded as angle but seems to be rear-end.
14	8/11/13	4:35 PM	2	Rear-end	1	Daylight	1	Clear	1	Dry	1	No Improper Driving	8/17/1975	1/13/1956			37	57	unk	An unknown vehicle stopped unexpectedly in front of V1 causing V1 to hit it, causing V2 to hit V1. The unknown vehicle fled the scene.
15	11/14/13	10:10 AM	3	Angle	1	Daylight	1	Clear	1	Dry	9	Failure to keep in proper lane or running off road	4/16/1994	12/16/1955			19	57		V1 attempted to access the Rt 24 on ramp from the left lane and hit V2 while cutting across.
16	12/17/13	10:50 AM	2	Rear-end	1	Daylight	2	Cloudy	1	Dry	19	Inattention	12/31/1971	1/31/1982			41	31		
17	12/26/13	10:45 AM	2	Rear-end	1	Daylight	5	Sleet, Hail, Freezing Rain	4	Ice	1	No Improper Driving	3/31/1942	8/9/1978			71	35		While merging onto Harrison Blvd, V1 stopped for unknown vehicle. V2 slid on ice into V1.
18	4/4/14	9:05 AM	2	Rear-end	1	Daylight	1	Clear	1	Dry	19	Inattention	2/26/1994	12/25/1976			20	37		V1 looked over shoulder to view traffic on Harrison Blvd and did not realize V1 had stopped in front of it.

Summary based on Crash Reports obtained from the Avon Police Department.

Crash Data Summary Tables and Charts

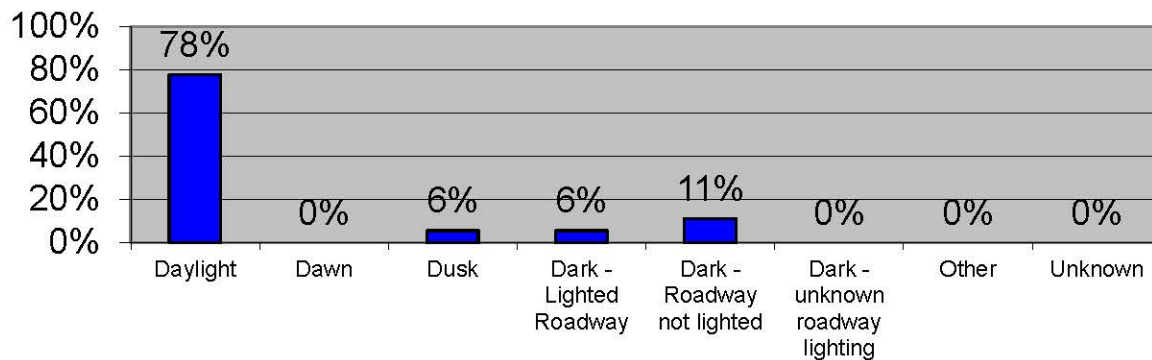
Harrison Blvd. at Route 24 Ramps, Avon, MA (Collision Diagram A)



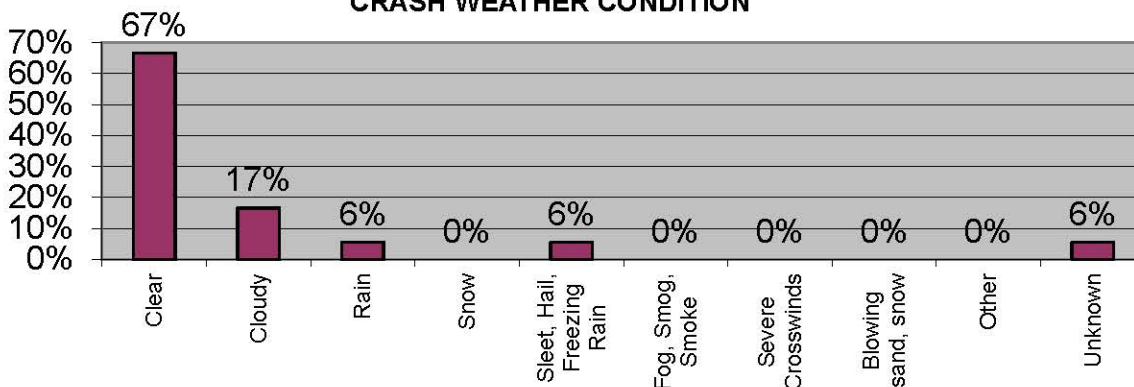
Crash Data Summary Tables and Charts

Harrison Blvd. at Route 24 Ramps, Avon, MA (Collision Diagram A)

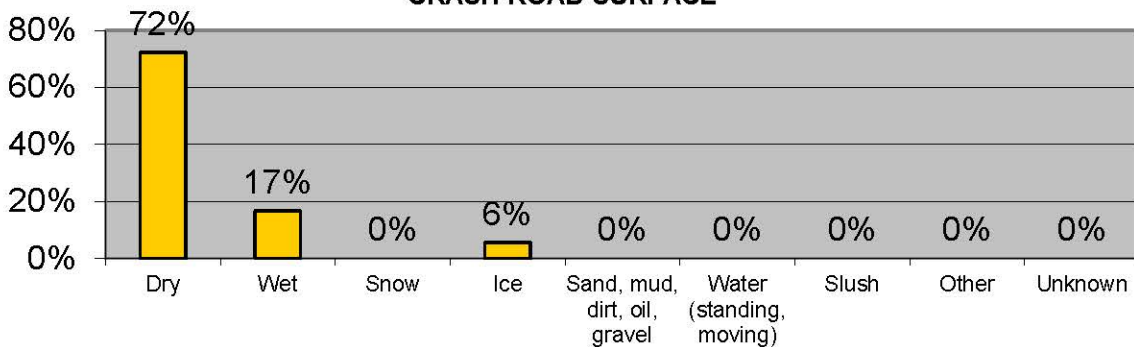
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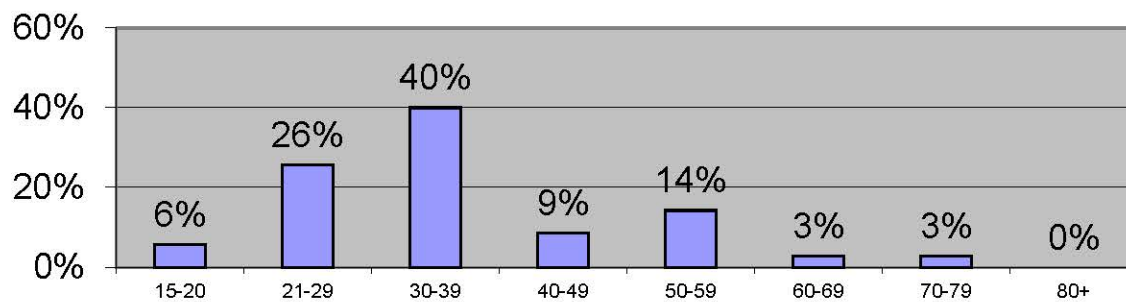
CRASH WEATHER CONDITION



CRASH ROAD SURFACE





CRASH DRIVER AGES










COLLISION DIAGRAM B

SYMBOLS

-  Moving Vehicle
-  Backing Vehicle
-  Non-Involved Vehicle
-  Pedestrian
-  Bicycle
-  Animal
-  Parked Vehicle
-  Fixed Object

TYPES OF CRASH

-  Head on
-  Rear End
-  Angle
-  Turning Movement
-  Sideswipe
-  Out of Control
-  Night Time Crash

SEVERITY

-  Injury
-  Fatal

Avon, MA

Harrison Blvd and Pond Street

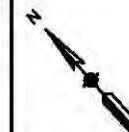
REGION: OCPC

TIME PERIOD ANALYZED: 1/1/2011 - 5/13/2014

SOURCE OF CRASH REPORTS: Avon Police Department

DATE PREPARED: 7/7/2014

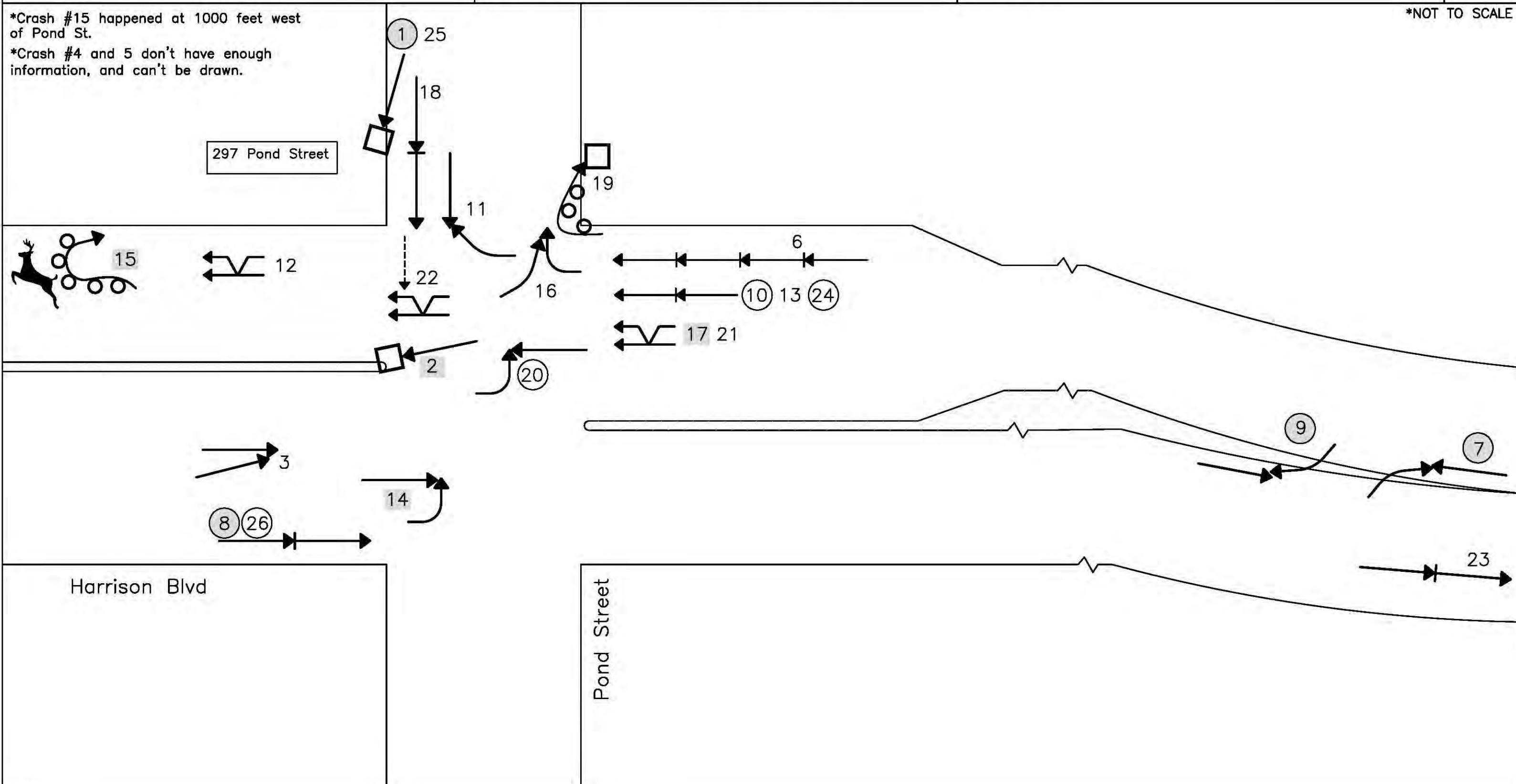
PREPARED BY: Yuan



*NOT TO SCALE

*Crash #15 happened at 1000 feet west of Pond St.

*Crash #4 and 5 don't have enough information, and can't be drawn.



Crash Data Summary Table

Harrison Blvd and Pond St, Avon, MA (Collision Diagram B)
1/1/2011 - 5/13/2014

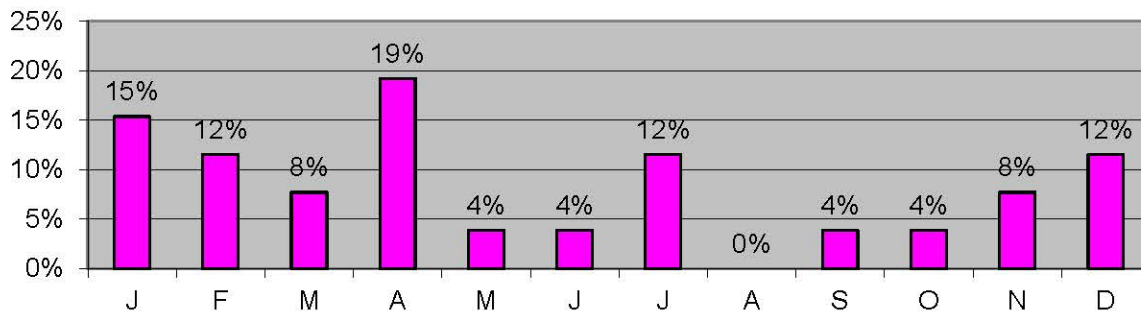
Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages				Comments
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	D4	
1	4/23/11	Saturday	3:30 AM	Single Vehicle Crash	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road	45				V1 going SB on Pond St hit two street signs and a fire hydrant.
2	7/25/11	Monday	9:50 PM	Single Vehicle Crash	Dark - lighted roadway	Rain	Wet	No Improper Driving	38				V1 was traveling WB on Hamison Blvd. V1 stated that unidentified SUV came through red light on Pond St turning left from Pond St, he made a sudden brake and swerved to avoid collision, then hit traffic sign.
3	7/26/11	Tuesday	5:20 PM	Sideswipe, same direction	Daylight	Clear	Dry	Unknown	34	28			V1 was slowing to stop for EB traffic light. V2 was trying to switch lanes after his initial stop, then hit V1.
4	9/5/11	Monday	12:00 AM	Unknown	Unknown	Unknown	Unknown	Unknown	UNK	UNK			not enough info
5	10/4/11	Tuesday	6:28 AM	Rear-end	Daylight	Cloudy	Wet	Unknown	40	29			not enough info
6	11/5/11	Saturday	4:44 PM	Rear-end	Daylight	Clear	Dry	No Improper Driving	59	67	UNK	UNK	V4 rear-ended V3 and pushed V3 into V2, then V3 pushed V2 into V1. All of them were traveling WB on Harrison Blvd.
7	12/18/11	Sunday	6:26 AM	Head on	Dark - roadway not lighted	Clear	Dry	Failure to keep in proper lane or running off road	48	32			V2 crossed into path of V1
8	1/11/12	Wednesday	12:00 AM	Rear-end	Dark - lighted roadway	Clear	Dry	Inattention	23	36			V1 stated he was traveling EB on Harrison Blvd and failed to stop due to inattention and struck V2 from behind.
9	2/9/12	Thursday	12:00 AM	Head on	Dark - roadway not lighted	Clear	Dry	Disregarded traffic signs, signals, road markings	31	41			V1 going WB on Hamison Blvd crossed the double yellow line, hit V2 going EB.
10	3/28/12	Wednesday	2:00 PM	Rear-end	Daylight	Rain	Wet	No Improper Driving	71	30			V2 rear-ended V1, both going WB on Harrison Blvd.
11	4/6/12	Friday	5:52 PM	Angle	Daylight	Clear	Dry	Illness	35	27			V1 was stopped at the red light on Pond St, then struck by V2. V2 going WB stated that she blacked out and didn't remember what happened.
12	5/3/12	Thursday	11:50 AM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	42	38			V1 hit V2 when changing lanes.
13	6/8/12	Friday	4:10 PM	Rear-end	Daylight	Clear	Dry	Inattention	56	31			V2 rear ended V1 when light turned green.
14	7/18/12	Wednesday	1:08 AM	Sideswipe, same direction	Dark - roadway not lighted	Clear	Dry	Made an improper turn	33	22			V1 attempted to turn left turn from the far right lane, then hit V2 which was traveling EB on Harrison Blvd.
15	11/1/12	Sunday	4:30 AM	Single Vehicle Crash	Dark - roadway not lighted	Clear	Dry	No Improper Driving	36	112			V1 stated he swerved to avoid a deer and lost control, when traveling west on Harrison Blvd.
16	12/1/12	Saturday	11:20 AM	Angle	Daylight	Rain	Wet	Failed to yield right of way	54	62			V1 turning right from Hamison Blvd onto Pond St NB hit the right side of V2 which was turning left from Harrison Blvd onto Pond St. with green arrow. V1 stated that he didn't see V2.
17	12/10/12	Monday	4:45 PM	Sideswipe, same direction	Dark - roadway not lighted	Rain	Wet	Unknown	54	32			V2 sideswiped V1 when changing lanes. Both vehicles were traveling WB on Hamison Blvd.
18	1/7/13	Monday	1:15 PM	Rear-end	Daylight	Clear	Dry	Inattention	45	27			V1 stated that he took eyes off the road and didn't notice V2 stopped, then rear-ended V2. Both vehicles were traveling SB on "right turn only" lane on Pond St.
19	3/29/13	Friday	6:46 AM	Single Vehicle Crash	Daylight	Clear	Dry	Operating defective equipment	40	113			V1 was traveling WB on Hamison Blvd. He stated that his gas pedal got stuck to the floor, so he directed his car into embankment.
20	4/10/13	Wednesday	1:45 PM	Head on	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	60	53			V1 turning left from Hamison Blvd onto Pond St NB was hit by V2 going WB on Harrison Blvd. V2 ran red light.
21	4/15/13	Monday	3:30 PM	Sideswipe, same direction	Daylight	Clear	Dry	Unknown	32	24			V1 sideswiped V2 when changing lanes. Both vehicle were traveling WB on Hamison Blvd.
22	1/19/14	Sunday	9:30 AM	Angle	Daylight	Cloudy	Snow	Disregarded traffic signs, signals, road markings	59	50	59		V3 run a red light going SB on Pond St. V1 tried to avoid V3 and swerved onto V2. Both V1 and V2 were traveling WB.
23	1/29/14	Wednesday	11:00 AM	Rear-end	Daylight	Clear	Dry	Unknown	52	41			V1 rear-ended V2. V1 stated that V2 just stopped in the middle of the road.
24	2/15/14	Saturday	11:27 AM	Rear-end	Daylight	Cloudy	Dry	Other improper action	43	22			While at red light, V2's foot slipped off brake causing it to rear-end V1.
25	2/20/14	Thursday	6:08 AM	Single Vehicle Crash	Dawn	Rain	Ice	Failure to keep in proper lane or running off road	43	114			V1 was trying to stop for lights at the intersection. Her vehicle slip on the icy road, then hit the snow bank on the side of the road.
26	4/13/14	Sunday	2:20 PM	Rear-end	Daylight	Clear	Dry	Other improper action	17	31			V2 slammed on brakes when light turned yellow due to the presents of a police vehicle. Police claim V2 should not have stopped.

Summary based on Crash Reports obtained from the Avon Police Department.

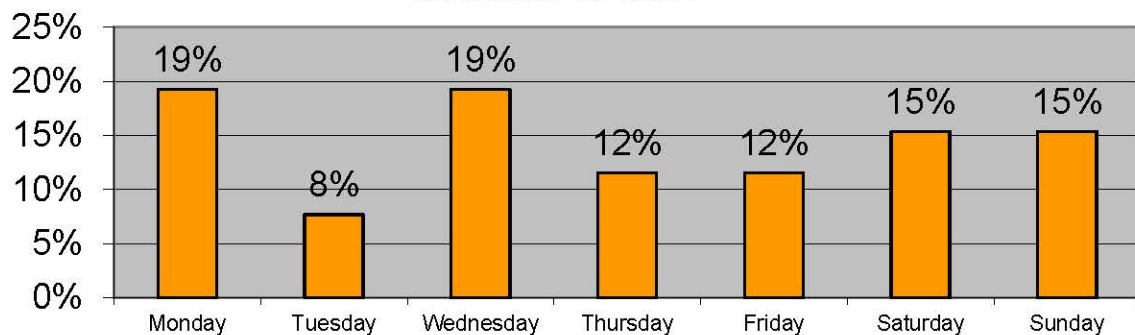
Crash Data Summary Tables and Charts

Harrison Blvd and Pond St, Avon, MA (Collision Diagram B)

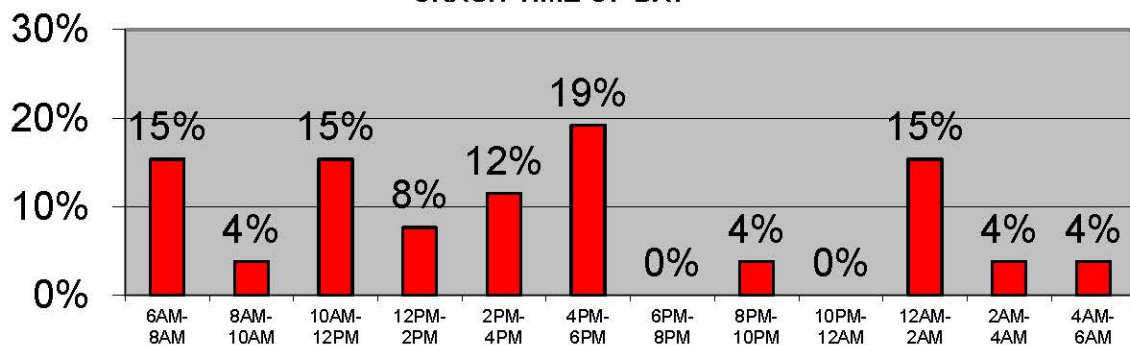
CRASH MONTH



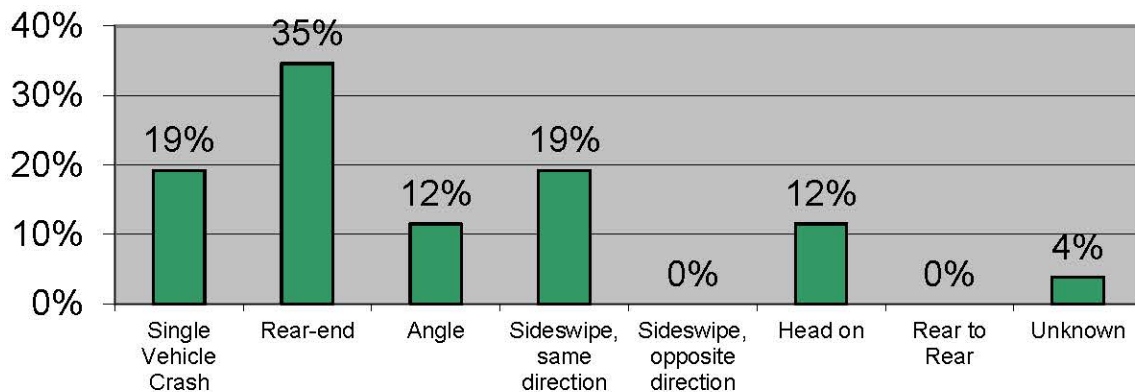
CRASH DAY OF WEEK



CRASH TIME OF DAY



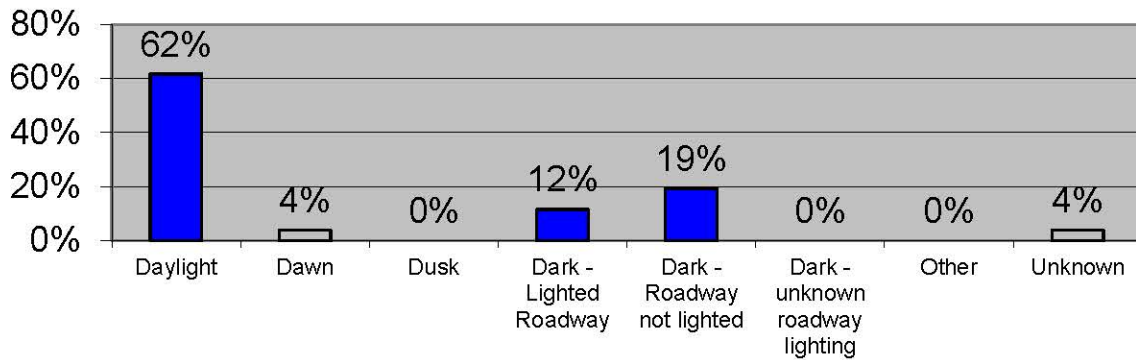
CRASH MANNER OF COLLISION



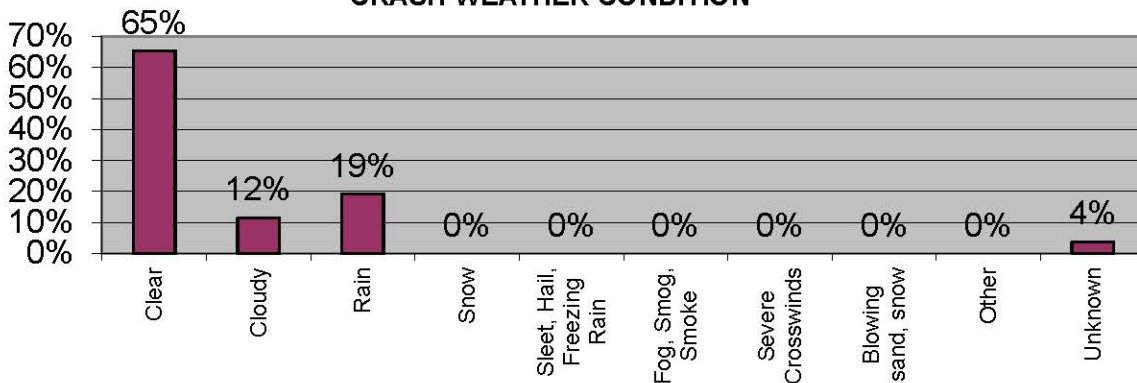
Crash Data Summary Tables and Charts

Harrison Blvd and Pond St, Avon, MA (Collision Diagram B)

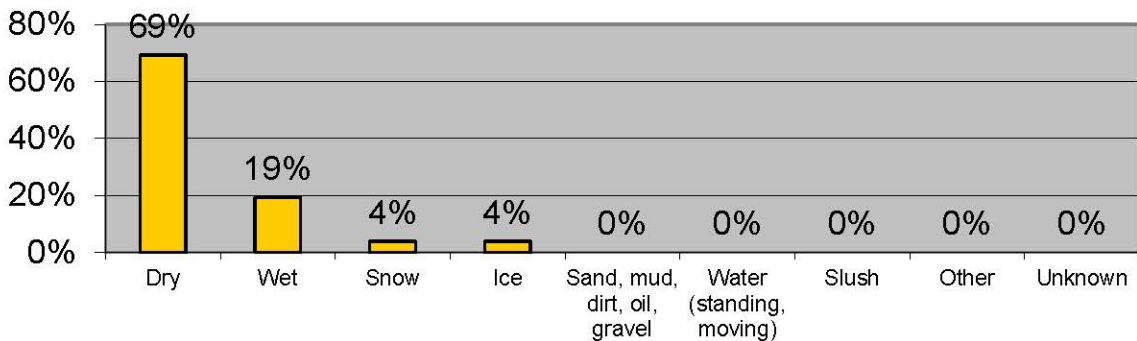
CRASH LIGHT CONDITION



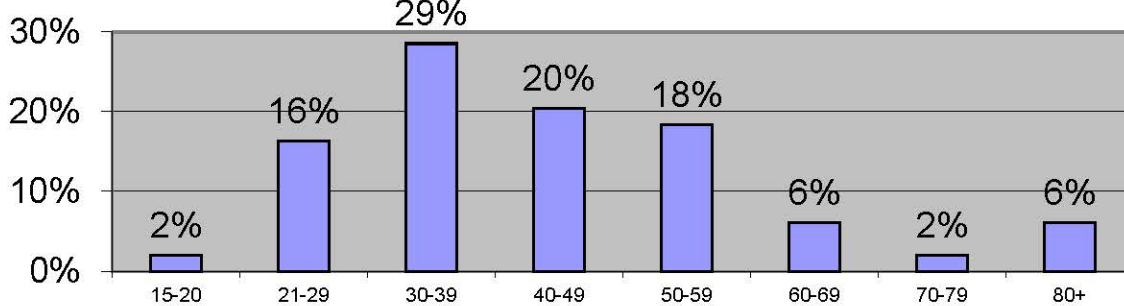
CRASH WEATHER CONDITION



CRASH ROAD SURFACE









CRASH DRIVER AGES










COLLISION DIAGRAM C

SYMBOLS

-  Moving Vehicle
-  Backing Vehicle
-  Non-Involved Vehicle
-  Pedestrian
-  Bicycle
-  Animal
-  Parked Vehicle
-  Fixed Object

TYPES OF CRASH

-  Head on
-  Rear End
-  Angle
-  Turning Movement
-  Sideswipe
-  Out of Control
-  Night Time Crash

SEVERITY

-  Injury
-  Fatal

Avon MA

Harrison Blvd at W Main St

REGION: OCPC

TIME PERIOD ANALYZED: 1/1/2011 - 5/13/2014

SOURCE OF CRASH REPORTS: Avon Police Department

DATE PREPARED: 7/2/2014

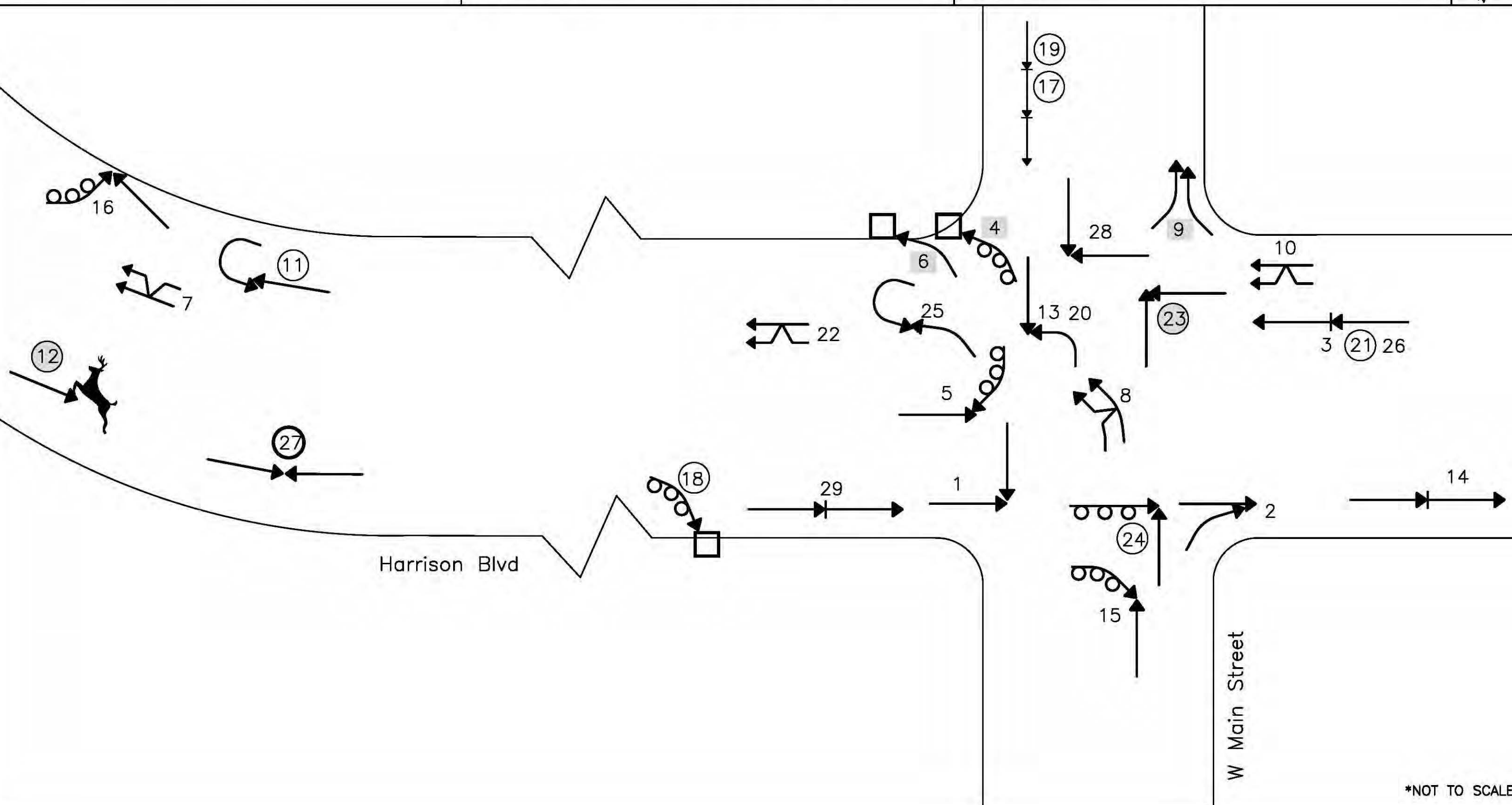
PREPARED BY: Yuan



Harrison Blvd

W Main Street

*NOT TO SCALE



Crash Data Summary Table
Harrison Blvd at W Main St, Avon, MA (Collision Diagram C)
1/1/2011 - 5/13/2014

Crash Diagram Ref #	Crash Date m/d/y	Crash Day	Time of Day	Manner of Collision Type	Light Condition Type	Weather Condition Type	Road Surface Type	Driver Contributing Code Type	Ages D1 D2 D3			Comments
1	2/20/11	Sunday	1:10 PM	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	21	36		V2 going SB on W Main St run a red light and hit V1 going EB on Harrison Blvd.
2	3/8/11	Tuesday	11:20 AM	Angle	Daylight	Clear	Dry	Unknown	66	80		V2 (EB) claims to have had a green light, V2 (NB) was unsure what color light was.
3	3/8/11	Tuesday	1:30 PM	Unknown	Unknown	Unknown	Unknown	Unknown	57	80		Both operators stated they heard sirens when approaching the intersection. V1 didn't see V2 stopped and hit V2.
4	4/21/11	Thursday	1:30 AM	Single Vehicle Crash	Dark - lighted roadway	Fog, Smog, Smoke	Dry	Inattention	20			V1 turning left onto Harrison Blvd stated that another vehicle traveling EB on Harrison Blvd caused him to swerve onto the curb.
5	6/1/11	Wednesday	6:32 PM	Angle	Daylight	Rain	Water (standing, moving)	Driving too fast for conditions	19	49		V1 turning right onto W Main St SB slide into V2 due to heavy rain and ponding water at catch basin. V2 was stopped on "left turn only lane" waiting to make a left turn onto W Main St.
6	10/16/11	Sunday	2:32 AM	Head on	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road	28	UNK		No narrative, from diagram, it seems like V1 turning left from W Main St onto Harrison Blvd run off road then hit the yellow merge sign.
7	11/28/11	Monday	7:40 PM	Sideswipe, same direction	Dark - roadway not lighted	Clear	Dry	Failure to keep in proper lane or running off road	43	76		V1 going WB on Harrison Blvd merged into V2 where the roadway merges from two lane to one lane.
8	2/15/12	Wednesday	9:45 AM	Sideswipe, same direction	Daylight	Cloudy	Wet	Disregarded traffic signs, signals, road markings	46	75		Both vehicles were turning left from W Main St onto Harrison Blvd. V2 which was behind of V1 trying to pass V1 from left side of V1 hit left bumper of V1.
9	2/23/12	Thursday	6:23 PM	Angle	Dark - roadway not lighted	Clear	Dry	No Improper Driving	95	34		V1 turning right from Harrison Blvd onto W Main St NB struck V2 turning left from Harrison Blvd onto W Main St NB with green arrow.
10	3/12/12	Monday	5:00 AM	Sideswipe, opposite direction	Daylight	Clear	Dry	Unknown	23	43		V1 stopped for the red light on Harrison Blvd WB. V2 swiped the driver side of V1.
11	4/15/12	Sunday	11:45 AM	Sideswipe, same direction	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	51	26		V2 going west on Harrison Blvd was hit by V1 who tried to make a U-turn from the right side of V2.
12	6/1/12	Friday	8:30 PM	Single Vehicle Crash	Dark - roadway not lighted	Clear	Dry	No Improper Driving	53			V1 going EB on Harrison Blvd hit a deer.
13	8/10/12	Friday	6:16 AM	Angle	Dawn	Cloudy	Dry	Failed to yield right of way	26	46		V2 turning left onto Harrison Blvd hit V1 going SB on W Main St.
14	10/23/12	Tuesday	4:50 PM	Rear-end	Daylight	Clear	Dry	No Improper Driving	27	28		Traffic stopped suddenly, V2 can't stop on time, rear-ended V1.
15	2/17/13	Sunday	9:30 AM	Angle	Daylight	Snow	Snow	Unknown	56	49		V2 was trying to make a right turn from Harrison Blvd onto W Main St. Due to heavy snow, V2 slide onto V1 which was stopped for a red light.
16	3/8/13	Friday	8:15 AM	Angle	Daylight	Snow	Snow	Driving too fast for conditions	39	39		Both vehicles were driving too fast in heavy snow condition. V1 was traveling EB, slide into V2 who was traveling WB.
17	6/14/13	Friday	1:55 PM	Rear-end	Daylight	Clear	Dry	No Improper Driving	34	65	21	All vehicles stopped. V3, distracted by cell phone charger, inches forward with traffic and hits gas instead of brake.
18	7/21/13	Sunday	6:36 AM	Single Vehicle Crash	Daylight	Clear	Dry	Fatigued/asleep	30			Operator 1 stated he was traveling EB on Harrison Blvd, he fell asleep causing him to drive off the road into a wooded area.
19	7/30/13	Tuesday	3:55 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	68	49		V2 rear-ended V1, both vehicles were traveling SB on W Main St.
20	10/28/13	Monday	6:29 AM	Angle	Dusk	Clear	Dry	No Improper Driving	38	30		V1 was turning left into Harrison Blvd, hit V2 which was traveling SB on W Main St. V1 stated that there was a truck in front of her and she can't see the coming traffic.
21	12/2/13	Monday	10:20 AM	Rear-end	Daylight	Cloudy	Wet	Inattention	45	31		Both vehicles was waiting for red light. When the light turn green, V2 didn't realize V1 was still stopped, then rear-ended V1.
22	12/9/13	Monday	7:42 AM	Sideswipe, same direction	Daylight	Snow	Wet	Failed to yield right of way	62	29		Both vehicles were going west on Harrison Blvd. V2 tried to get ahead of V1 and hit V1 just west of W Main St where two lanes merge into one lane.
23	1/1/14	Wednesday	5:42 AM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	43	49		V1 going WB on Harrison Blvd was hit by V2 who was going NB on W Main St running a red light.
24	1/10/14	Friday	7:33 AM	Angle	Daylight	Rain	Wet	Disregarded traffic signs, signals, road markings	55	32		V1 was going NB on W Main St and hit by V2 which was going EB on Harrison Blvd. V2 stated that she tried to stop for red light but slid on wet roadway into the intersection striking V1.
25	2/11/14	Tuesday	7:55 AM	Angle	Daylight	Clear	Dry	Made an improper turn	30	25		Both vehicles were turning left onto Harrison Blvd. V1 pulled into breakdown lane and attempted to take a U-turn then hit V2.
26	3/5/14	Wednesday	2:25 PM	Rear-end	Daylight	Snow	Wet	Driving too fast for conditions	45	17		V1 stopped, V2 skidded into V1.
27	3/16/14	Sunday	12:28 AM	Head on	Dark - roadway not lighted	Clear	Dry	Wrong side or wrong way	25	48		V1 traveling WB on Harrison Blvd crossed double yellow line, then stuck V2 head on. V2 was traveling EB on Harrison Blvd. Operator of V1 perunenced dead on scene.
28	3/24/14	Monday	10:45 AM	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	24	74		V1 traveling WB on Harrison Blvd run a red light hit V2 which was traveling SB on W Main St.

Crash Data Summary Table

Harrison Blvd at W Main St, Avon, MA (Collision Diagram C)

1/1/2011 - 5/13/2014

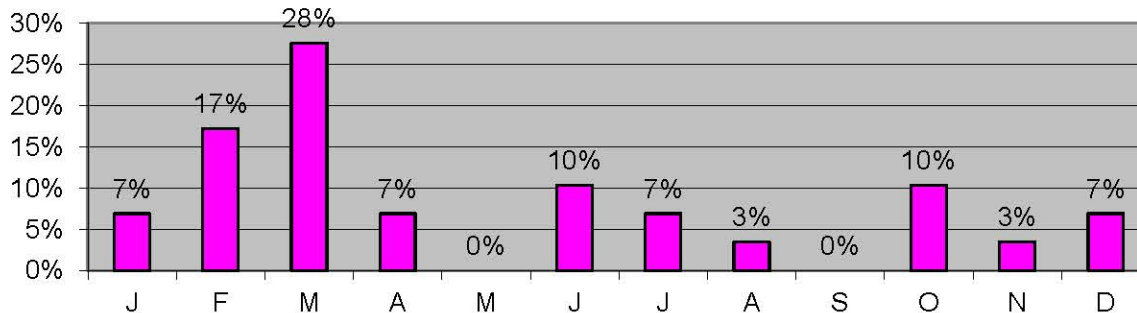
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	m/d/y								D1	D2	D3	
29	3/31/14	Monday	11:40 AM	Rear-end	Daylight	Rain	Wet	Followed too closely	64	29		V2 rear-ended V1, both vehicles were traveling EB on Harrison Blvd.

Summary based on Crash Reports obtained from the Avon Police Department.

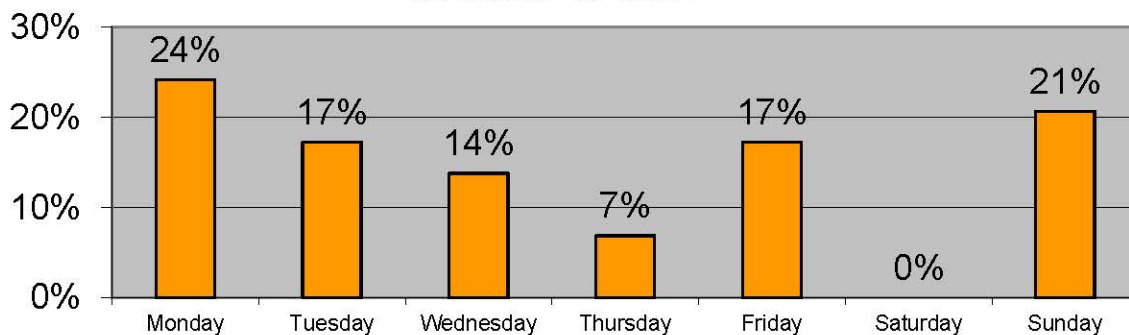
Crash Data Summary Tables and Charts

Harrison Blvd at W Main St, Avon, MA (Collision Diagram C)

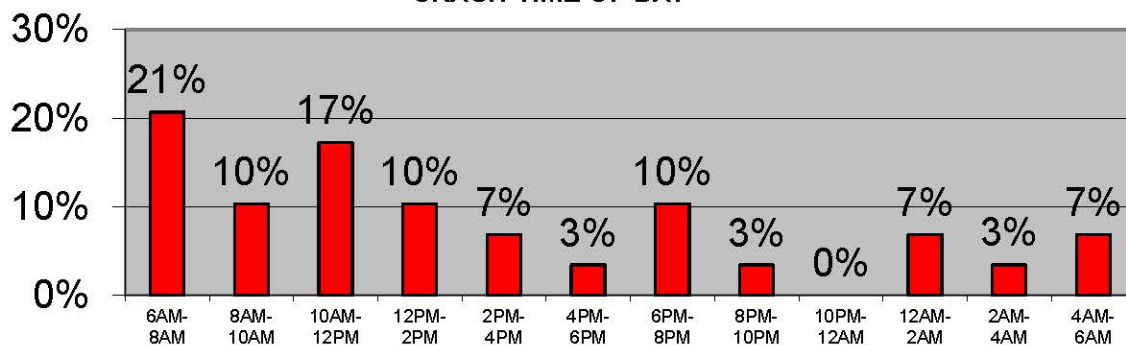
CRASH MONTH



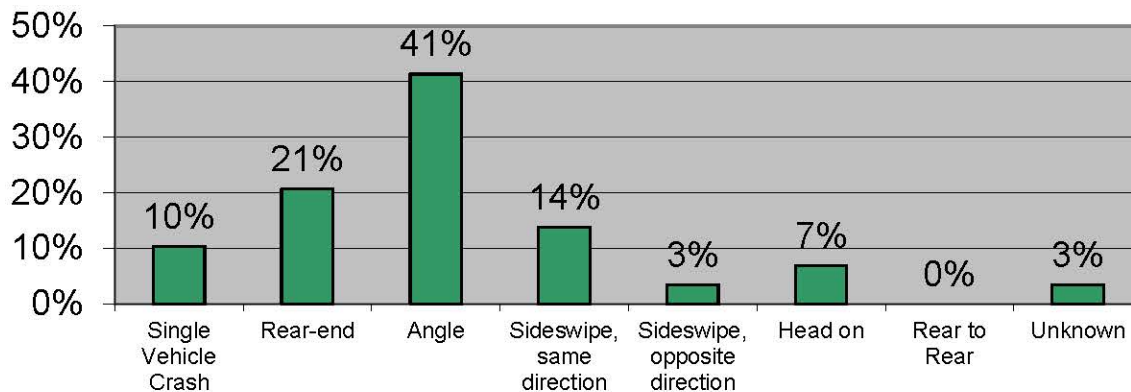
CRASH DAY OF WEEK



CRASH TIME OF DAY



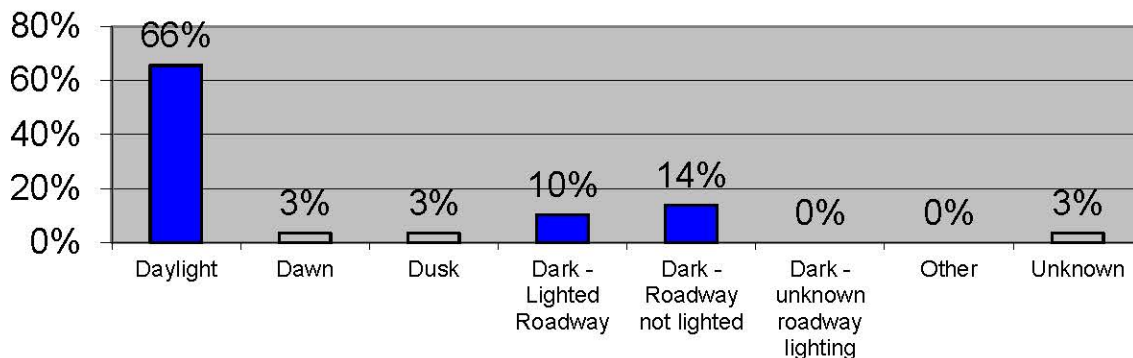
CRASH MANNER OF COLLISION



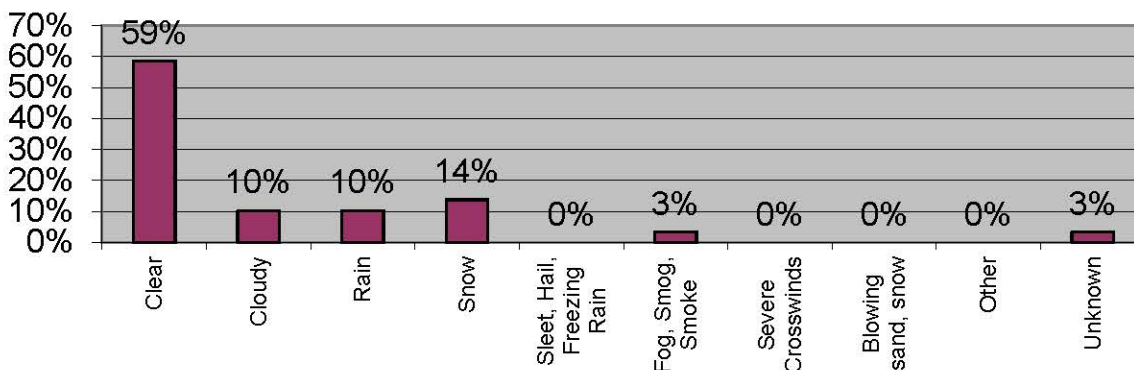
Crash Data Summary Tables and Charts

Harrison Blvd at W Main St, Avon, MA (Collision Diagram C)

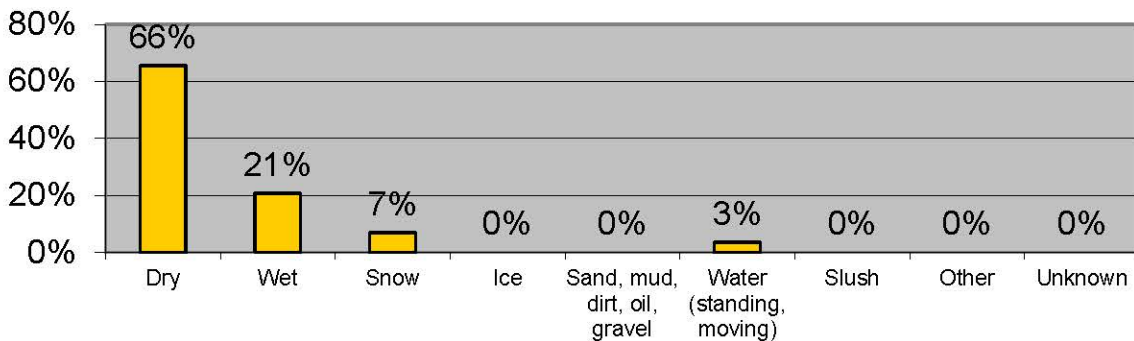
CRASH LIGHT CONDITION



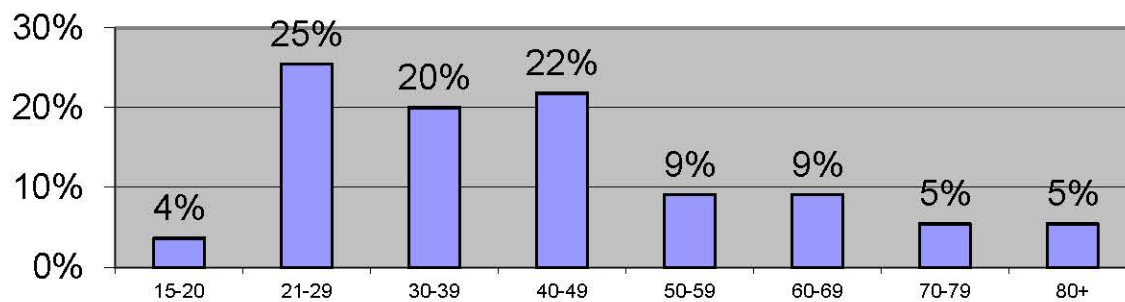
CRASH WEATHER CONDITION



CRASH ROAD SURFACE







CRASH DRIVER AGES










COLLISION DIAGRAM D

*NOT TO SCALE

SYMBOLS

-  Moving Vehicle
-  Backing Vehicle
-  Non-Involved Vehicle
-  Pedestrian
-  Bicycle
-  Animal
-  Parked Vehicle
-  Fixed Object

TYPES OF CRASH

-  Head on
-  Rear End
-  Angle
-  Turning Movement
-  Sideswipe
-  Out of Control
-  Night Time Crash

SEVERITY

-  Injury
-  Fatal

Avon MA

Harrison Blvd and East Main Street (Rt28)

REGION: OCPC

TIME PERIOD ANALYZED: 1/1/2011 - 5/13/2014

SOURCE OF CRASH REPORTS: Avon Police Department

DATE PREPARED: 7/1/2014

PREPARED BY: Yuan

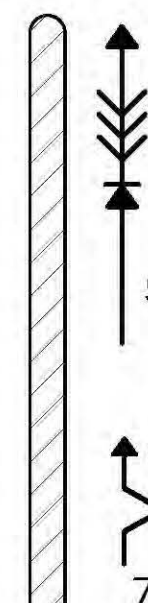
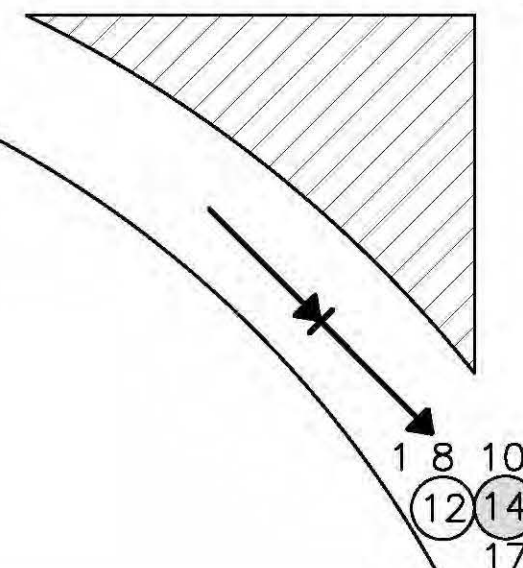
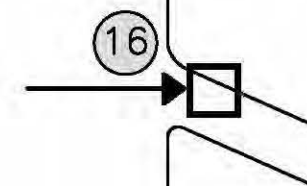


Harrison Blvd

VFW Drive

East Main Street
(Rt28)

230 East Main St



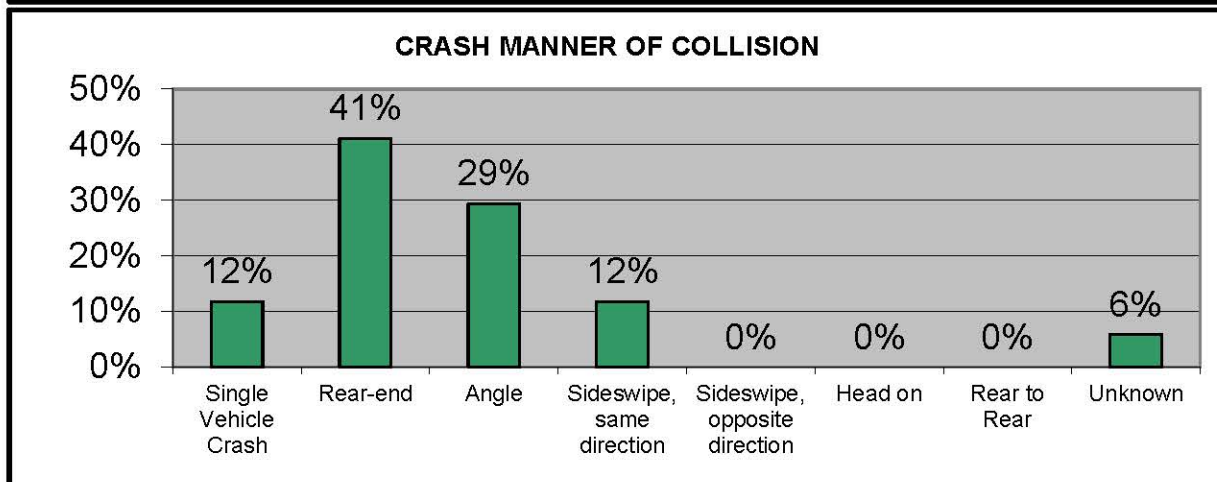
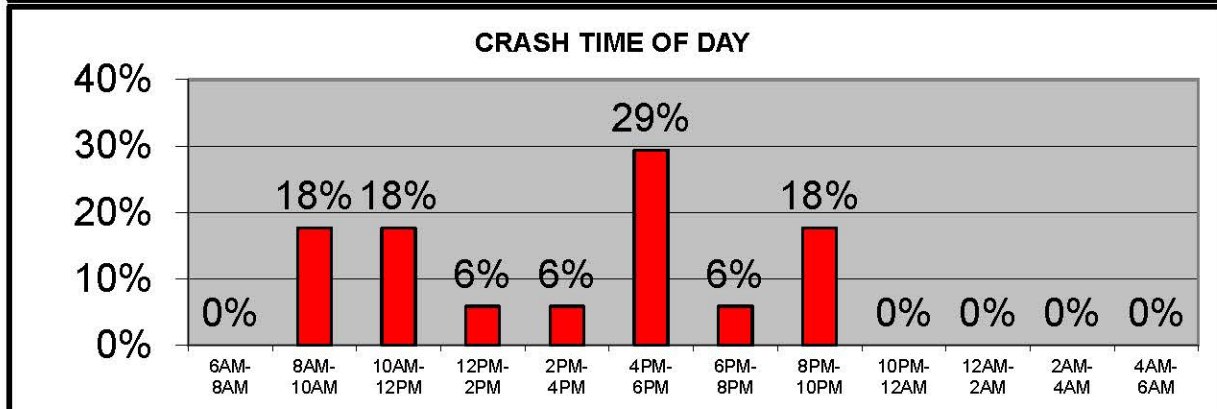
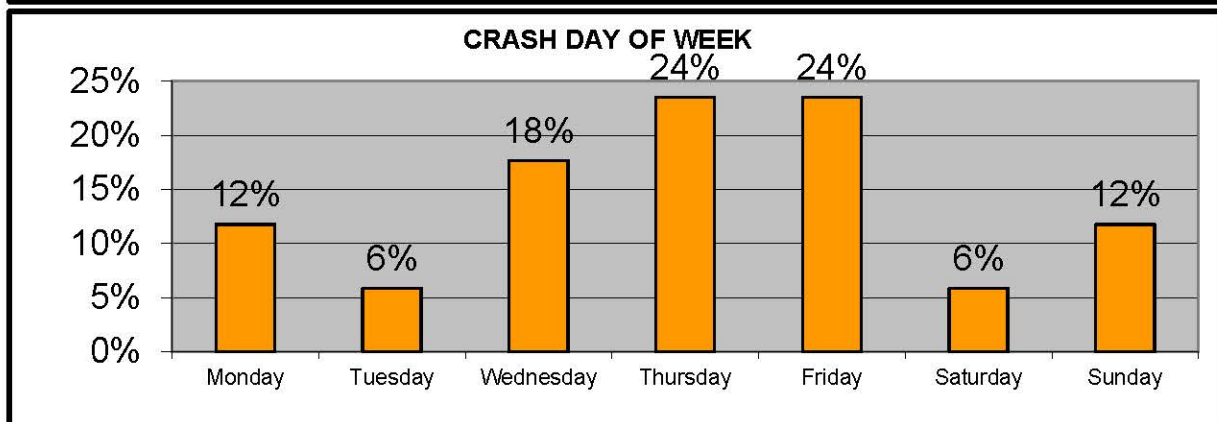
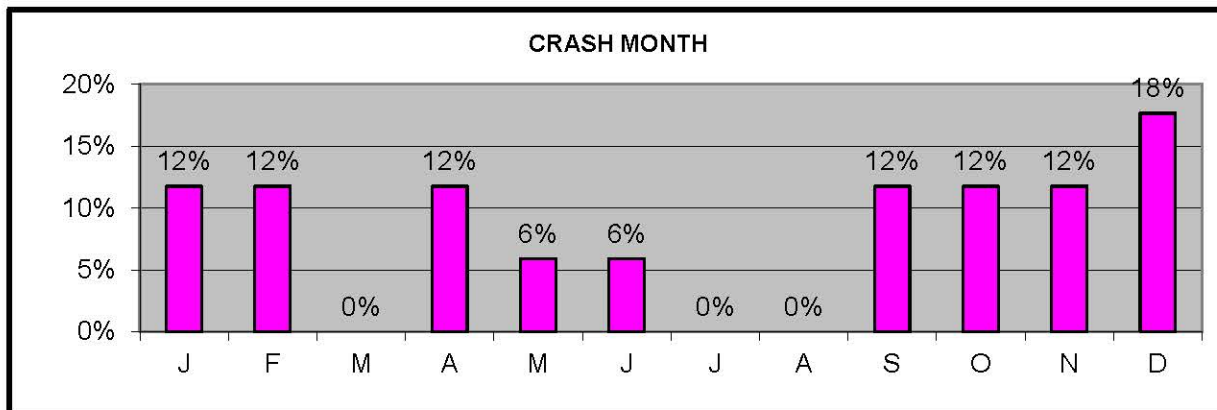
Crash Data Summary Table
Harrison Blvd and Rt 28 (East Main St), Avon, MA (Collision Diagram D)
1/1/2011 - 5/13/2014

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
	m/d/y								D1	D2	D3	
1	1/26/11	Wednesday	10:25 AM	Rear-end	Daylight	Cloudy	Wet	Inattention	19	58		V2 stated that he was stopped at the yield sign to check for SB traffic on Rt28 when rear-ended by V1.
2	9/15/11	Thursday	6:50 PM	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	23	44		V1 going SB was talking on cell phone, ran the red light and hit V2 turning left onto Rt28 NB.
3	12/29/11	Thursday	8:49 PM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	30	25	47	V2 turning left on a yellow light was hit by V1 going SB on Rt28, which then hit V3 waiting for traffic light on Harrison Blvd.
4	2/17/12	Friday	4:40 PM	Angle	Dusk	Clear	Dry	Failure to keep in proper lane or running off road	80	61		V1 was turning left onto VFW Drive, hit V2 going EB on Harrison Blvd. V2 went around stopped traffic and failed to keep in proper lane.
5	4/24/12	Tuesday	3:06 PM	Unknown	Daylight	Clear	Dry	Inattention	53	30		V1 stopping for red light on Rt28, pushed in the clutch when the traffic light turned green and her vehicle rolled back into V2.
6	9/8/12	Saturday	11:24 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	34	36		V2 stated that she didn't realize the light was red and rear-ended V1.
7	10/3/12	Wednesday	4:48 PM	Sideswipe, same direction	Daylight	Cloudy	Dry	No Improper Driving	36	28		V2 hit V1 when changing from left turn only lane to the middle lane.
8	12/3/12	Monday	9:30 AM	Rear-end	Daylight	Clear	Dry	Inattention	19	55		V1 rear-ended V2 due to sun glare.
9	12/14/12	Friday	8:05 AM	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	23	48		V2 failed to stop for a red arrow when attempting to turn left onto Harrison Blvd, then hit V1 going SB.
10	5/22/13	Wednesday	12:32 PM	Rear-end	Daylight	Cloudy	Dry	Followed too closely	45	23		V1 turning right followed too closely and hit the back of V2.
11	6/21/13	Friday	9:37 AM	Angle	Daylight	Cloudy	Dry	Operating Vehicle in erratic, reckless, careless, negligent, or aggressive manner	21	40		No narrative. From the diagram, it seems like that V1 hit V2 from back and kept driving.
12	10/27/13	Sunday	11:30 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	54	38		V2 rear-ended V1 when V1 was yielding to enter the traffic lane on Rt 28.
13	11/10/13	Sunday	4:36 PM	Single Vehicle Crash	Dusk	Cloudy	Dry	No Improper Driving	38	53		V2 stated that she was traveling straight ahead when V1 turned in front of her she struck it. The Manner of collision should be Angle and not Single Vehicle Crash.
14	11/15/13	Friday	5:34 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Inattention	59	22		V2 rear-ended V1 when V1 was yielding to enter the traffic lane on Rt 28.
15	1/2/14	Thursday	8:55 PM	Sideswipe, same direction	Dark - lighted roadway	Blowing Sand, Snow	Snow	No Improper Driving	79	22		V2 stated that he was traveling EB when he slid into V1 due to the blizzard conditions.
16	2/3/14	Monday	9:08 PM	Single Vehicle Crash	Dark - lighted roadway	Sleet, Hail, Freezing Rain	Water (standing, moving)	Other improper action	unk			V1 failed to negotiate a turn striking stone foundation at 230 East Main St.
17	4/3/14	Thursday	4:20 PM	Rear-end	Daylight	Clear	Dry	Inattention	40	unk		V2 rear-ended V1 when V1 was slowing yielding to enter the traffic lane on Rt 28.

Summary based on Crash Reports obtained from the Avon Police Department.

Crash Data Summary Tables and Charts

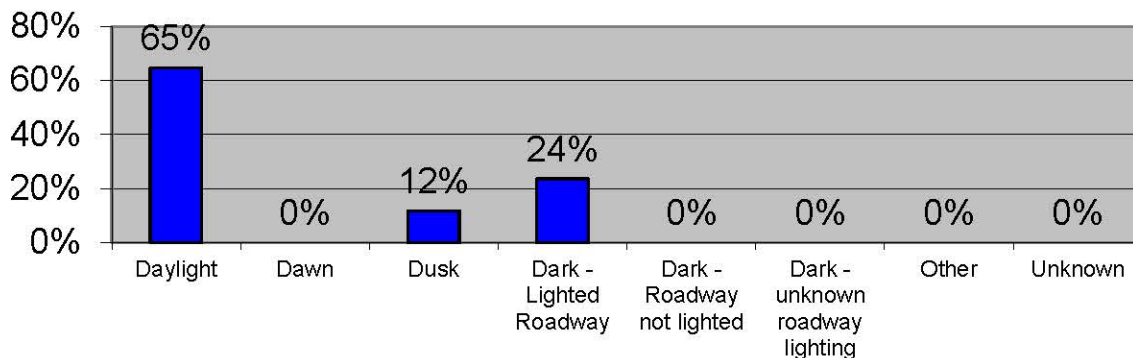
Harrison Blvd and Rt 28 (East Main St), Avon, MA (Collision Diagram D)



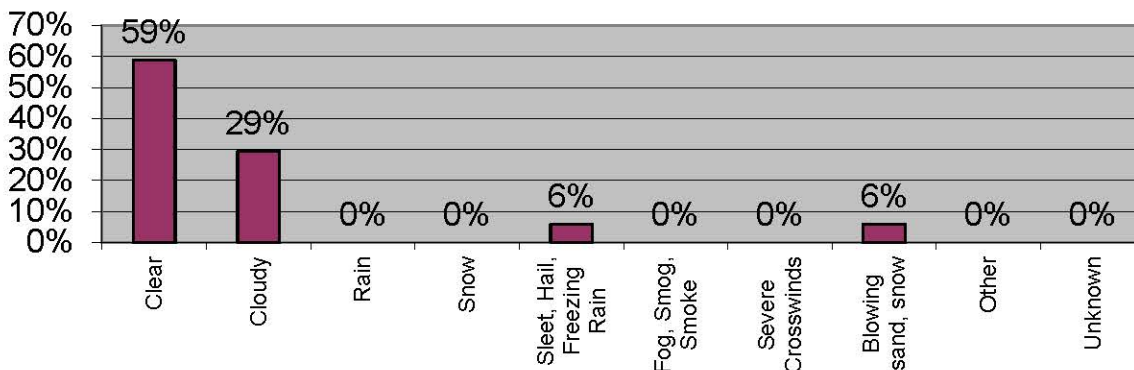
Crash Data Summary Tables and Charts

Harrison Blvd and Rt 28 (East Main St), Avon, MA (Collision Diagram D)

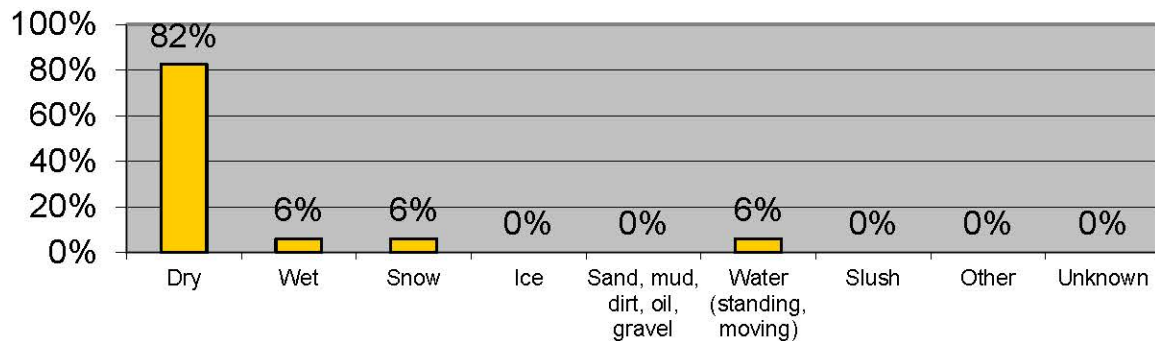
CRASH LIGHT CONDITION



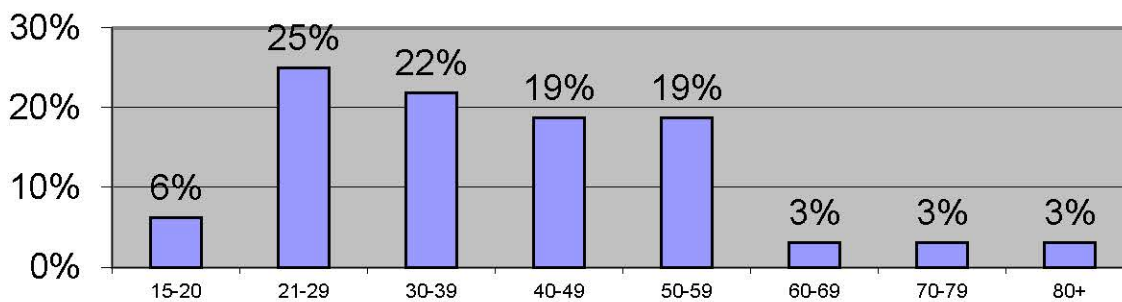
CRASH WEATHER CONDITION



CRASH ROAD SURFACE



CRASH DRIVER AGES



Crash Data Summary Table

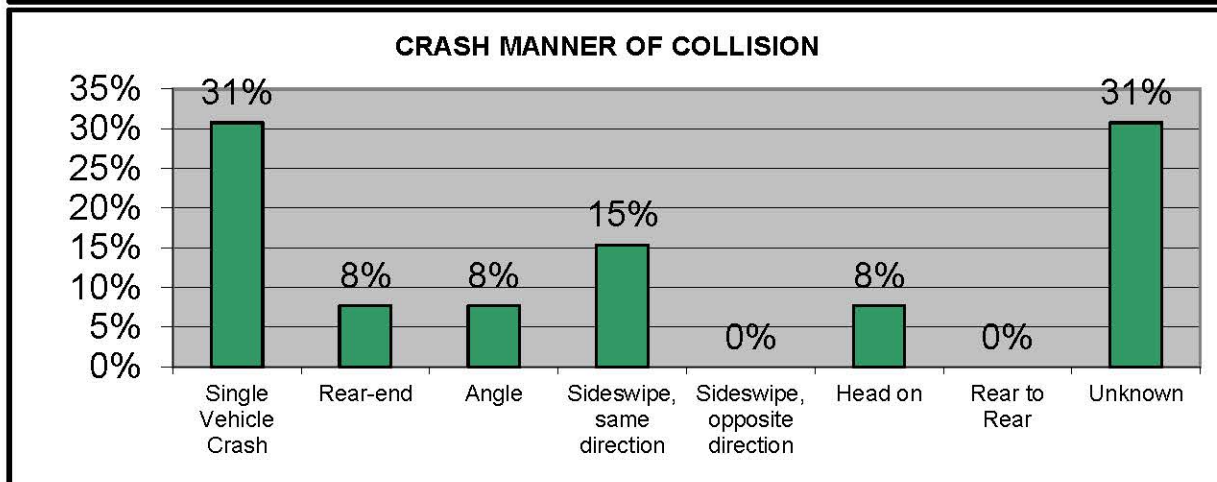
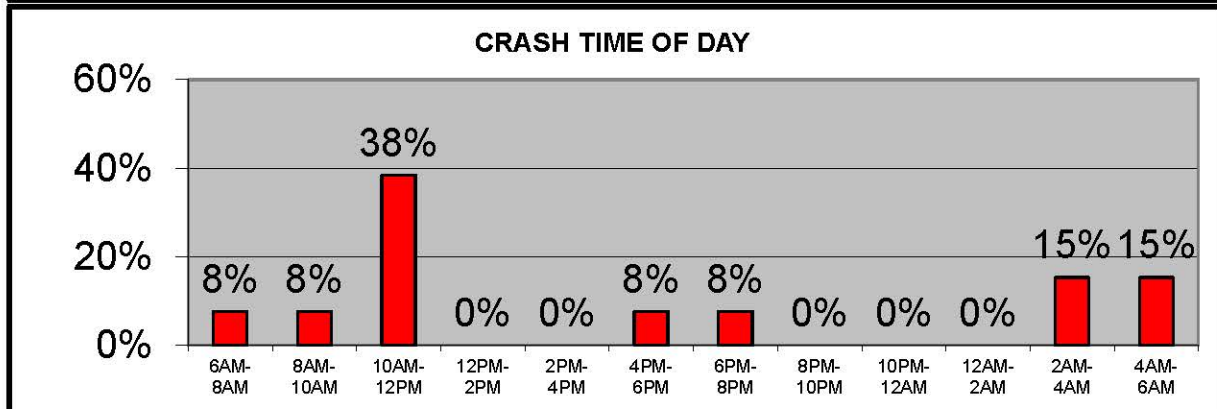
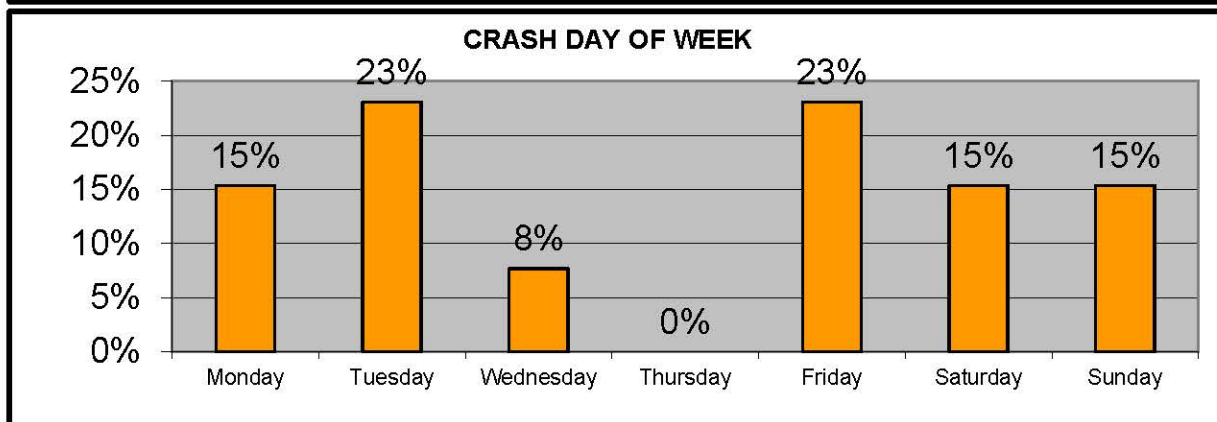
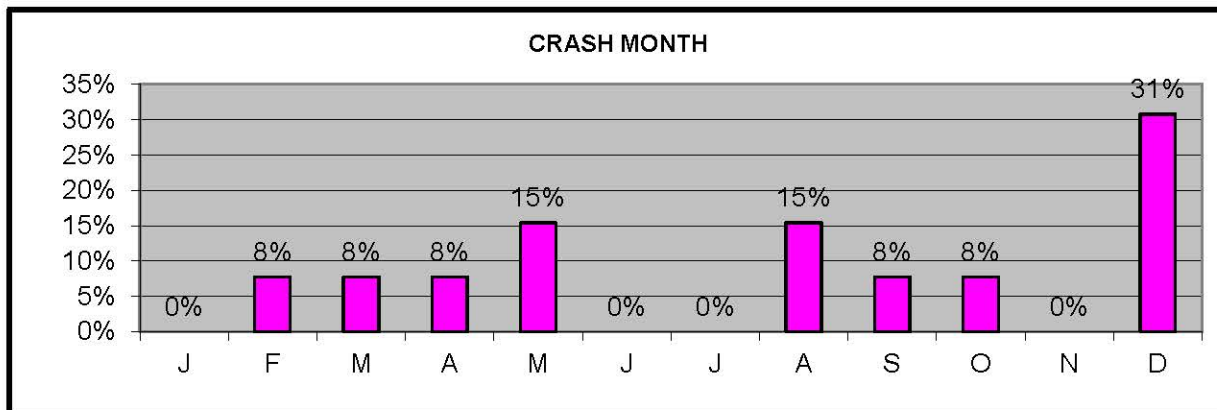
Unidentified locations not at an intersection, Avon, MA
1/1/2011 - 5/13/2014

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages		Comments
	m/d/y			Type	Type	Type	Type	Type	D1	D2	
1	8/16/11	Tuesday	11:50 AM	Unknown	Unknown	Unknown	Unknown	Unknown	35	43	V1 was traveling WB on Harrison Blvd. Operator of V1 stated that he turned to reach into the rear seat, when he did this he swerved into EB traffic striking V2 and V3.
2	3/2/12	Friday	5:46 AM	Unknown	Dusk	Clear	Unknown	Unknown	39	23	V2 rear-ended V1, both going EB on Harrison Blvd.
3	4/29/12	Sunday	5:47 AM	Single Vehicle Crash	Dawn	Clear	Dry	Fatigued/asleep	17		The oprator of V1 fell asleep and went off the road.
4	5/19/12	Saturday	8:41 AM	Single Vehicle Crash	Dark - roadway not lighted	Clear	Dry	No Improper Driving	51		V1 traveling WB on Harrison Blvd hit a deer.
5	9/21/12	Friday	11:40 AM	Angle	Daylight	Clear	Dry	Made an improper turn	20	47	V2 traveling EB on Harrison Blvd struck V1 which making a U-turn from the side of EB Harrison Blvd to WB.
6	10/8/12	Monday	11:45 AM	Sideswipe, same direction	Daylight	Clear	Dry	Other improper action	40	27	V1 trying to pass V2 sideswiped V2. Both vheicle were going EB on Harrison Blvd.
7	12/7/12	Friday	7:45 PM	Sideswipe, same direction	Dark - lighted roadway	Cloudy	Wet	Unknown	55	22	V1 stated that a uninvolved vehicle in front of him slowed down, he swerved into V2 to avoid collision with uninvolved vehicle.
8	12/29/12	Saturday	7:27 AM	Head on	Daylight	Cloudy	Dry	Fatigued/asleep	73	43	The oprator of V1 going EB fell asleep and swerved into opposite lane, then hit V2 which was going WB on Harrison Blvd.
9	2/6/13	Wednesday	2:43 AM	Single Vehicle Crash	Dark - roadway not lighted	Snow	Snow	Unknown	21		The oprator of V1 stated he lost control of his vehicle due to the snow.
10	8/25/13	Sunday	3:11 AM	Single Vehicle Crash	Dark - roadway not lighted	Clear	Dry	Failure to keep in proper lane or running off road	24	22	V1 tried to avoid V2, then hit the curb. V2 was trying to pass around V1. Both vehicles were traveling EB on Harrison Blvd.
11	12/24/13	Tuesday	10:30 AM	Unknown	Unknown	Unknown	Unknown	Unknown	22		There was an accident in left lane. V1 started to slid and hit guard rail.
12	12/24/13	Tuesday	10:30 AM	Unknown	Daylight	Sleet, Hail, Freezing Rain	Ice	No Improper Driving	20	40	V1 drifted into guard rail on right, then hit V2. Both vehicles were going WB on Harrison Blvd.
13	5/5/14	Monday	4:20 PM	Rear-end	Daylight	Clear	Dry	Physical Impairment	53	62	V2 came around two vehicles, rear-ended V1. All vehicles were going EB on Harrison Blvd.

Injury Crash

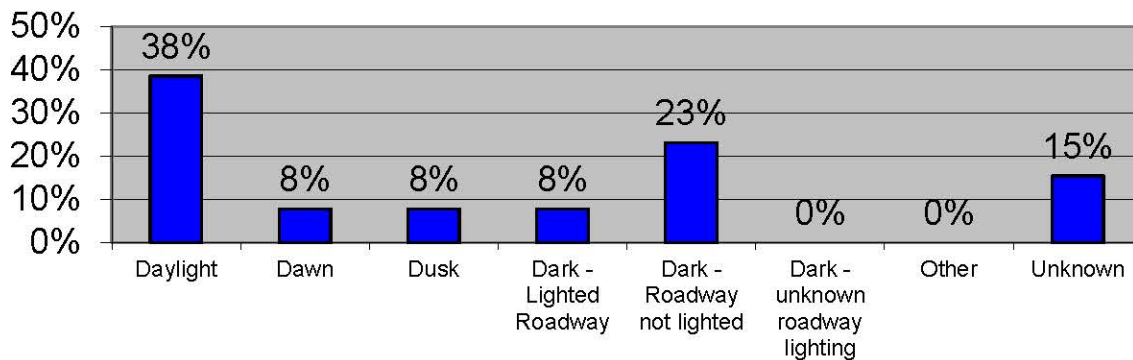
Summary based on Crash Reports obtained from the Avon Police Department.

Crash Data Summary Tables and Charts
Unidentified locations not at an intersection, Avon, MA

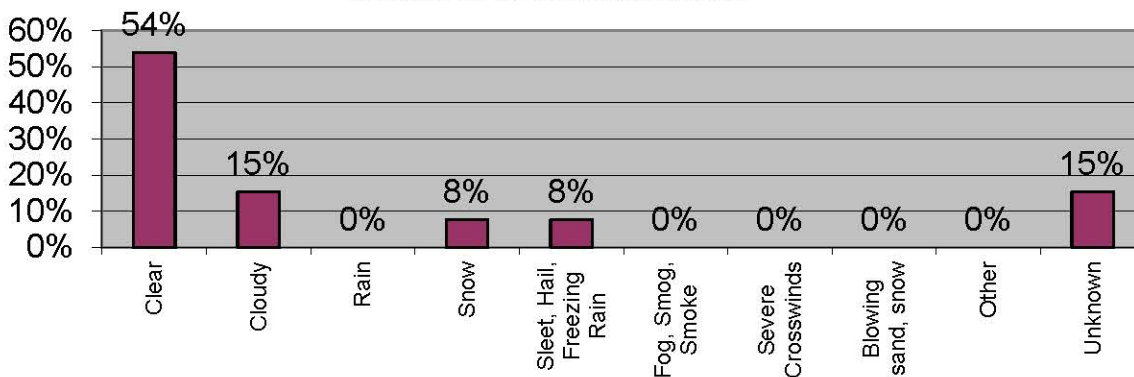


Crash Data Summary Tables and Charts
Unidentified locations not at an intersection, Avon, MA

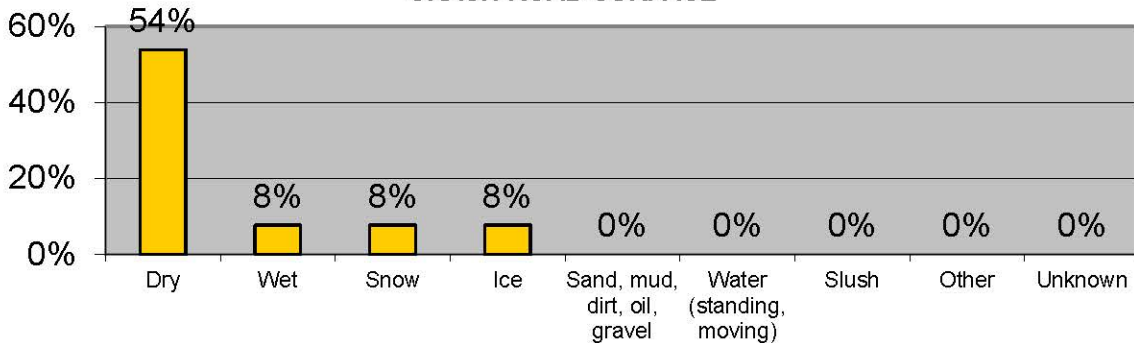
CRASH LIGHT CONDITION



CRASH WEATHER CONDITION



CRASH ROAD SURFACE



CRASH DRIVER AGES

